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GLADIATORS AT ANCYRA

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INTRODUCTION

The public fascination with the gladiators of the Roman Empire was exemplified relatively recently by the highly commercial success of the US $ 110 million film *Gladiator* (2000), albeit those from an earlier generation or knowledgeable on the subject matter prefer its more reliable and oft-repeated predecessor, *Spartacus* (1960). Despite the popularity of these films, and their bias towards the gladiators of Rome and Italy, it is surprisingly little known just how ubiquitous gladiatorial displays were in the Roman World. This is especially true of its Hellenised parts, areas where earlier historians believed the local 'civilised' peoples rejected such 'barbaric' spectacles on high moral grounds.[2]

It is a fact that purpose-built permanent amphitheatres are rare in the Greek-speaking parts of the Roman Empire. In Anatolia, for example, only three are known, at Anazarbus, Pergamum, and Cyzicus, although the double-ended stadium at Laodicea (dedicated between AD 79 and 81) was clearly designed for gladiatorial shows also, as its naming as a *στάδιον άμφιθέατρον*, a 'stadium-amphitheatre', demonstrates.[3] Nonetheless, convincing evidence for the popularity of such shows in this specific region is provided by the physical remains of theatres converted for the purpose at a number of Anatolian *poleis*: at Ephesus, for example, a 2.5 m. high screen wall replaced the lower rows of seats around the orchestra to protect spectators from escaping animals or gladiators.[4] Even better, the same *polis* has revealed graphic evidence for the way in which gladiatorial fights were often to the death. Forensic analysis of 67 male skeletons from the Ephesus 'gladiator's cemetery' has revealed explicit evidence for the violent manner in which

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[2] The belief was based on the writings of those belonging to the Second Sophistic, e.g., Plut. *Non Posse* 1099b, referring to gladiators 'who are not altogether bestial' – albeit in the sense they were on a higher moral plateau to the lowest of the low, the Epicureans. Perusal of the seminal studies by Robert 1940, 1946, 1948, 1949 and 1950, with over 340 gladiatorial texts and reliefs from the Greek-speaking world, should dispel completely any doubts on their popularity in the Romanised Hellenic World.

[3] For Anazarbus, at about 62 x 83 m. internally, cf. Gough 1952, 100; for Pergamum, at about 180 x 150 m. externally, cf. Radt 1999, 263-66; for Cyzicus, also at about 180 x 150 m. externally, cf. Rustafjaell 1902, 186-87, with Hasluck and Anderson 1904, 140-41. For Laodicea, cf. Welch 1998a, 563, and especially *IGR* 4.845 and 861: other double-ended *stadia* such as that at Aphrodisias and Nicopolis were also presumably designed with this purpose in mind: Welch 1998a, 559-561 and 563-565.

[4] The best-documented example of the process is at Corinth: cf. Stillwell 1952, 84-98.

some of them died, mainly through cranial injuries, the result of the 'death-blow' inflicted on mortally wounded gladiators.[5] Moreover, Ephesus can also claim a place of fame – if that is the right word – in being the first Anatolian *polis* known to have held any form of gladiatorial display, L. Licinius Lucullus holding a gladiatorial show there in 70/69 BC to commemorate his victory over Mithridates and the restoration of law and order to greater Anatolia.[6] That aside, perhaps the most persuasive evidence for the popularity of shows of this nature throughout Anatolia is to be found in the form of the many funerary monuments of deceased gladiators reported from the major urbanised centres of Asia Minor. Ancyra, the *metropolis* of Galatia, has its own fair share of such monuments, along with other reliefs and epigraphic texts relating to the various gladiatorial games held there, and it is these that provide the main focus of this paper. Before looking at the evidence from Ancyra, however, it may be useful to briefly review the evidence for the gladiatorial games in their wider context.[7]

THE GLADIATORIAL GAMES

Despite some uncertainty over their precise origin, the Romans certainly adopted the idea of gladiatorial shows as a form of public spectacle from the Etruscans, the first such 'spectacle' at Rome being held in 264 BC as part of the funeral ceremonies for D. Junius Brutus.[8] This was offered as a *munus*, a 'duty' paid by his sons as a way of keeping his memory alive, and funeral *munera* of this kind were held until the final days of the Republic. But when Julius Caesar promised to pay for 320 gladiatorial matches at the funeral games of his daughter Julia in 46 BC, his ostensibly altruistic motives were recognised for what they really were: electoral bribery. In fact by then, gladiatorial shows whether for entertainment and/or as a covert or even overt electoral bribe had certainly become a part of the way of life in some parts of Italy, as is shown by the construction at Pompeii of the earliest known purpose-built amphitheatre in *c*. 80 BC.

The political and electoral value of the *munera* promoted by those seeking or elected to public office was one of the many matters Augustus thought necessary to regulate during his reforms to the earlier Republican system of government at Rome. Thus he placed a limit on both their frequency and expense,[9] although he happily provided them in his own name whenever he thought necessary or appropriate: indeed, he

[5] For a general introduction to the evidence, cf. Krinzinger 2002; for more detailed studies of the injuries, cf. Kanz and Großschmidt 2002, 2005 and 2006.

[6] Plut. *Luc.* 23. For other gladiatorial shows in Asia Minor in the pre-Imperial period, cf. Cic. *Att.*, 6.3.9, referring to gladiators at Laodiceia, and *Phil*. 6.13, noting a combat between a *murmillo* and *thraex* at Mylassa; also Dio 51.7.2-7, reporting gladiators at Cyzicus who belonged to a private school maintained by Mark Antony.

[7] Despite its lack of an index, Junkelmann 2000 provides the most succinct analysis of the origins, history, weapons, armour and techniques of the gladiators and the gladiatorial games. Although there is epigraphic and figural evidence from Ancyra for the *venationes* or wild-beast hunts that frequently took place in association with gladiatorial games, discussion of these events is excluded from this article, as they involved professional *venatores* and *bestiarii*, not gladiators.

[8] Val. Max. 2.4.7.

[9] Dio 54.2.3-4.

paid for no less than eight different games involving some 5,000 pairs of gladiators before his death in AD 14.[10] Nero, for his part, also faced the problem of gladiatorial shows being used as a form of bribery, in this case by his provincial governors and procurators: thus his decree of AD 58 forbidding them from holding such spectacles on the grounds they were methods of corruption.[11] However, as before, private citizens were allowed to hold their own *munera* outside of Rome and the popularity of such shows might be gauged from Nero's decision to punish Pompeii for a riot in its amphitheatre in AD 59 by banning any *munera* there for a period of 10 years.[12] That aside, the reign of Trajan saw a peak in gladiatorial games at Rome, with 10,000 displayed over 123 days to celebrate his capture of Dacia,[13] although the high point for these shows in Anatolia probably came in the mid-2nd century, to judge from the widespread adaptation of theatres for this purpose at that time.[14] Moreover, the same general period saw the issue of an imperial fiat to limit the use of public funds for such displays.[15] As it was, the widespread economic collapse associated with the 'Third Century Crisis' undoubtedly resulted in a forced decline of gladiatorial events, with gladiators (and wild animals) for display purposes being harder to obtain. In any case, by the beginning of the 4th century public attitudes towards gladiatorial shows were changing: thus Constantine seems to have faced little opposition when he issued a decree in 325 banning gladiators from public spectacles,[16] although they continued to perform into the 5th century.[17]

By the High Empire, it seems that four classes of gladiators had become especially common. Two were of the 'heavy' class, the *murmillo*, named for the fishfin-like crest on his helmet, and who was armed with a short straight *gladius*; [18] and the *thraex*, named for his 'Thracian'-type *sica*, a sword 'bent' at an angle of about 30 degrees in the middle to give an upturned point.[19] Both of these types of gladiator carried large rectangular shields and wore a closed helmet with a network-pierced visor and a flanged neck-guard, the helmet worn by the *thraex* having a crest terminating in an animal protome. In addition, both types wore *fasciae*, a thick padded arm protector on their right arms, while the *murmillo* also wore a single short greave on his left leg, the *thraex* having a pair of long greaves. The two other common classes of gladiator were of the 'light' variety, namely the *secutor*, or 'chaser', who was armed with a *gladius*;[20] and (his usual opponent) the *retiarius* or 'fisherman', named after the trident, weighted net and dagger that formed his

[10] *Res Gestae* 22.1.

[11] Tac. *Ann*. 13.31.

[12] Tac. *Ann*. 14.17.

[13] Dio 68.15; cf. Bennett 2001, 101-102.

[14] Golvin 1988, 237: the theatre at Aphrodisias, for example, was converted under Antoninus Pius (AD 139-61): Reynolds 1991, 19.

[15] *Dig*. 1.8.6, of Hadrian or Antoninus Pius. Note also a senatorial decree of AD 177 placing a limit on spending for the spectacles: Mitchell 1993, 110, with n. 68 and 70.

[16] *Cod. Theod*. 13.12.11; cf. *Cod. Just*. 11.44.

[17] Welch 1998a, 568, with n. 74.

[18] Junkelmann 2000, 110-11.

[19] Junkelmann 2000, 119-20.

[20] Junkelmann 2000, 111.

offensive weapons.[21] The *secutor* wore an egg-shaped helmet with a thin upright crest and two eyeholes in the visor, and carried a large rectangular shield, along with *fasciae* on his right arm and a short greave on his left leg. The *retiarius*, however, wore neither helmet nor greaves, nor did he carry a shield: his defensive armour consisted solely of *fasciae* on his left arm, with a short metal *manica* protecting his left shoulder and extending upwards to cover the left side of his neck.

Generally speaking, a single combat between two gladiators involved a *murmillo* against a *thraex* or a *secutor* against a *retiarius*, but this rule was not an exclusive one, with other combinations (and other classes of gladiators) being known from the literature and from depictions on mosaics and so forth. That apart, the literary evidence is clear that during the High Empire, many gladiators were 'amateurs', in the sense of being men pressed into such service (*damnatus ad ludum*), either as prisoners of war, or as condemned criminals worthy of something more than straightforward capital punishment.[22] However, from both the literary and the epigraphic evidence it is equally clear that many gladiators were true 'professionals', who belonged to private or imperial schools or *familiae*, either as slaves bought and trained for the purpose, or as freemen who volunteered for the fame and prosperity that came to a highly successful gladiator. Thus while gladiatorial shows between the 'amateurs' were little more than brutal fights to the death until the last man available that day was standing, the 'professionals' fought by rules, with a senior and junior referee, the *summa* and *secunda rudis*, supervising combat.[23]

These referees took their titles from the wooden rod (*rudis*) they carried, and with which they could interrupt a fight whenever necessary. This might be after an agreed time, when one man was declared the winner, but perhaps more usually when one gladiator suffered either from exhaustion or a serious flesh wound, signalling his defeat by raising the fore-finger of his left hand in the air: hence the popular cry that a fight be 'to the finger' and not a timed event.[24] Less usually, or so it would seem, at least in the early Imperial Period (see below), the fight would be to the death – 'less usually' simply because professional gladiators were expensive investments, and several epigraphic texts testify how some defeated or wounded gladiators certainly did live to fight another day. If, however, the crowd so-desired, a defeated gladiator was condemned to die through their use of the *pollice verso*, the 'turned thumb'.[25] Popular belief would have it that this was the 'thumbs-down', but documentary evidence and marks on the throat-vertebrae of certain gladiator skeletons at Ephesus suggests it was the 'thumbs-up', signifying death by an upward thrust with sword or dagger beneath the chin of the man thus condemned. On the other hand, the evidence of hammer-blows to some of the gladiator's heads at Ephesus would seem to confirm the literary evidence that a mortally wounded fighter

[21] Junkelmann 2000, 124-27.

[22] Junkelmann 2000, 24-26; Pliny *Ep*. 31 refers to criminals at Nicomedia and Nicaea among other places in Bithynia who had been sentenced this way but who had managed to have themselves made public slaves – in some cases with an annual salary.

[23] Junkelmann 2000, 134-35.

[24] E.g., Mart, *Spect*. 31.5.

[25] Juv. 3.34-37; Prud. Clem. *contra Symm*. 2.1096.

might be put to death by this method.[26] That aside, it is clear that from the early to middle Imperial periods, there was an overall increase in fights to the death between professional gladiators.[27]

THE EVIDENCE FROM ANCYRA

1) The oft-cited 'Imperial Priest List' inscribed during the early 1st century AD on the *pronaos* of the so-called Temple of Rome and Augustus at Ancyra provides us with some of the earliest evidence for the popularity of such shows in Asia Minor.[28] The relevant parts read:

a) In AD 20/21, (?)Castor, son of king Brigatus, provided – *inter alia* – 'gladiatorial spectacles[29] with 30 pairs of gladiators, bull-hunts, and wild-beast hunts'.

b) In AD 21/22, Rufus organised '(gladiatorial) shows (and) a hunt'.

c) In AD 22/23, Pylaemenes, son of king Amyntas, gave the people 'two gladiatorial spectacles … bull fighting, (and) a hunt'.

d) In AD 24/25, Amyntas supervised '(gladiatorial) shows'.

e) In AD 30/31, Pylaemenes, son of king Amyntas, again organised a festival that included 'gladiatorial spectacles … bull fighting; bull wrestling; 50 pairs of gladiators … (and a) wild-beast fight'.

f) In AD 31/32, (?)M. Lollius gave a display of '25 pairs of gladiators (at Ancyra) and 10 pairs at Pessinus'.

g) After a gap of at least seven years, Pylaemenes, son of Menas, provided '30 pairs of gladiators'.

h) His successor, (?)Iulius Aquila, organised '(gladiatorial) shows'.

In all, then, between the years AD 20/21 and *c*. 40-45, the High Priests of Ancyra organised and paid for no less than eight gladiatorial shows as part of their annual festivities, using at least 135 pairs of gladiators. Unfortunately, no details are provided of the types of gladiators used: however, a gladiatorial show at Mylassa in about 50 BC included a fight between a *murmillo* and a *thraex*,[30] revealing that these classes of gladiator were available in Anatolia in the Republican period. Indeed, as we will see, these were in fact the most popular pairings by far in the Greek-speaking East.

[26] Cf. Kanz and Großschmidt 2006, with Tert. *Apol*. 15.4.

[27] Ville 1981, 318-25.

[28] For the text, cf. Bosch 1967, 35-49, no. 51; the most conveniently available discussion of this document remains that of Mitchell 1993, 100-117, with a translation on p. 108, on which the following is based. For other places with gladiatorial events in the 1st century AD, cf. Robert 1940, 264-65.

[29] The usual Greek term for describing gladiatorial spectacles was *μονομάχως* (as here), meaning 'single-combat', but the term *θέας* for 'shows' was also used (as in other entries).

[30] Cic. *Phil*. 6.13.

The gladiatorial shows recorded on the 'Imperial Priest List' belong to a period long before the earliest of the seven or eight monuments cited in the literature that indicate gladiatorial games at Ancyra. On account of their stylistic and epigraphic features, these monuments can all be broadly dated to between the early/mid-2nd and early 3rd century and that being so, it will be perhaps best to describe them in their original order of discovery and/or publication.

2) The 1.5 m. high funerary monument to the 57 years-old *summarudis* Publius Aelius from Pergamum, carved in the form of a funerary *bomos* (Fig. 1) can be dated to the mid or later 2nd century as his name shows that either he or one of his forebears received citizenship under Hadrian.[31] Dedicated by his wife Aelia, she taking her husband's name as her own in accordance with Roman custom, the text records that Aelius was a member of the college of *summarudes* at Rome itself, and also an honorary citizen of Thessalonica, Nicomedia, Larisa (either Larisa, Greece, or Larisa in the Troad), Philippopolis, Apros, Berge (*sic*, for Perge), Thasos, Bizye and Abdera. As we have seen, a *summarudis* was the senior ranking of the two referees in a gladiatorial contest, and this text provided the first evidence that the *summarudes* were officially organised as a *collegia*. That aside, Aelius' honorary citizenship of no less than nine places in the Eastern Empire should represent communities where he served honourably as a *summarudis*. Of greater interest is that the badly abraded relief shows Aelius in the usual costume worn by a *summarudis*, his striped tunic tied at the waist and his striped mantle of office over his shoulders.[32] His left hand is wrapped in the mantle and his right hand holds an object that has usually been interpreted as the *rudis* symbolising his office, although autopsy and the width of the damaged area suggests he was holding both a rod and a palm branch.

3) The 50 cm. high funerary plaque of the *murmillo* Peitheros is the sole Ancyran gladiator's monument with a secure provenance, having been found in 1927 in the huge Roman cemetery complex that once existed near the Railway Station (Fig. 2).[33] The text provides the barest of facts: his name, Peitheros; his place of origin, Oescus (modern Gigen, Bulgaria); and the name of the monument's dedicator, Messenia. The lack of any indication as to Messenia's relationship to Peitheros suggests that she was a slave concubine, and so Peitheros probably held the same status, slaves being forbidden legal marriage. The rather spirited relief shows Peitheros advancing to the left and depicts him as a short stocky man: while this was doubtless an established 'artistic conceit' for such tombstones – the shorter the relief, the cheaper the price! – the evidence from Ephesus indicates that gladiators were indeed generally broad, stocky and flat-footed men, their

[31] Robert 1940, 138-39, no. 90 = Bosch 1967, 188-91, no. 149 = French 2003, 180-81, no. 69. This relief and its inscription are very abraded and no attempt has been made to reproduce or restore the full text on this in Fig. 1: for such information the relevant bibliographical references should be consulted.

[32] The costumes of the *secunda*- and *summarudes* are excellently depicted on two mosaics from Rome, revealing their mantles and tunics to be striped in blue: cf. Junkelmann, Abb. 215-216.

[33] Jerphanion 1928, 225-27 (the cemetery), and 269-70, no. 44 (this stone) = Robert 1940, 137, no. 88 (with ibid 1949, Pl. VIII. 2) = Bosch 1967, 192-93, no. 151 (where Peitheros is wrongly described as a *secutor* on the basis of the crest alone and ignoring the clear indications of a pierced visor) = French 2003, 182, no. 70.

heavy musculature covered with plenty of fat from a lentil and barley rich diet to better absorb flesh wounds.[34] Peitheros is armed in typical *murmillo* fashion, wearing a heavy crested helmet, with network-pierced visor and flange, and carrying a *gladius* in his right hand and a broad heavy shield with his left. In addition, he wears the usual short greave on left leg, and also *fasciae* on his right leg as well as on his right arm. Included in the relief are a palm-branch and two crowns,[35] signifying that he had won at least two victories before his death.

4) The 66 cm. high funerary plaque of the *retiarius* Calleidromos, who came from the province of Asia, showed him advancing to the right (Fig. 3).[36] He wears ankle-braces and a short tunic, tied at the waist by a belt with a large buckle. He is armed with a dagger in his right hand, and carries an upright trident in his outstretched left arm, his net apparently being thrown back over his right shoulder. The relief includes a dog standing by his legs, and six crowns behind him and a seventh in front, these representing his total of seven victories.[37] The text begins by boasting of his courage in the *σταδίοις*, the reference in the plural meaning 'many *stadia*',[38] and goes on with the brag that he was first *palus* among the *retiarii*, the first *palus* being the senior of his class in a gladiatorial school. It then goes on to laconically note that in his eighth fight he met his death through the doings of the *Moirai*, the inescapable 'Fates', and ends with the equally curt statement that none of the dead can escape their decisions.[39] As the relief lacks a dedicator, this could mean that Calleidromos was part of a *familia* of gladiators, the monument being erected after his death by his fellow *retiarii* to honour his earlier successes.

5) A statue base dedicated to an *ignotus* who served four-times as the *agoranomos* of Ancyra was erected by the eighth tribe of Ancyra in honour of his services to his fellow-citizens.[40] These included *inter alia* 'gladiatorial shows, animal fights, and shows' over a period of 51 days.

6) An undecorated funerary monument for a *thraex* named Danaos was erected in his memory by his wife Tycharion[41]. The text describes him as being of the 'first category', that is, he was first *palus* in his gladiatorial *familia*, and gives his origin as Anazarbus in Cilicia.

[34] Their barley-rich diet resulted in a popular nickname for gladiators: *hordearii,* meaning 'barley eaters' (Pliny *HN* 18.72). Indeed, unlike the stereotypes provided by Kirk Douglas in *Spartacus* and by Russell Crowe in *Gladiator*, these men were physically more akin to the hapless pseudo-*murmillo* in the film *Life of Brian* (1979), who dies of a heart attack while pursuing a Jewish criminal initially armed as a *retiarius*.

[35] Not one crown, as reported in French 2003, 182.

[36] Robert 1940, 138, no. 89 = Bosch 1967, 191-92, no. 150.

[37] Jerphanion 1928, 270-272, no. 445 = Robert 1940, no. 89 (= ibid 1948, 93 , with Pl. X.1) = Bosch 1967, 191-92, no. 150. From the evidence surveyed by Ville 1981, 318-25, few gladiators in the later Imperial period survived their third combat: Calleidromos was indeed chancing the judgement of the *Moriai* with an eighth combat.

[38] Cf. Welch 1998b, 127-28.

[39] After all, even Zeus chose not to protect Sarpedon and Hector from the machinations of the *Moirai*: *Il.* 16.435-58 and 22.174-76.

[40] Robert 1940, 137, no. 87 – Bosch 1967, 117-118, no. 101.

[41] Robert 1950, 40, no. 328.

7) A fragmented and much abraded 96 cm. high relief panel (Fig, 4), perhaps from a funerary plaque or less likely a relief celebrating a specific *munus*, has a scene from a *venatio* with a dead lion and bear and a *bestiarius*(?) in the upper register, and four gladiators in combat in the lower.[42] The pair on the left are both gladiators of the 'heavy class', as is shown by their large oblong shields. The left-hand gladiator wears a closed round helmet with a wide flange that extends over his shoulders, and carries a shield in his left hand and a short *gladius* in his right, his right arm being protected by *fasciae* and his left leg by a greave tied behind his leg with bands. The lack of a crest on this man's helmet suggests he is a *provocator*, a variant of the more usual *murmillo* and *thraex* type of gladiator.[43] These men also wore a pectoral to protect their chest, although on the relief the shield covers this part of the man's body. Even so, his identification as a *provocator* is assured by the two folds of cloth that dangle between his legs, as this class of gladiator wore a short tunic sometimes tied with a band that hung down to the knees.[44] His opponent, on the other hand, is clearly a *thraex*, his helmet-crest terminating in a protome, and his right hand holding a *sica* resting against the edge of his adversary's shield, with both of his legs being protected with greaves tied at the back with bands. The left-hand of the second pair of gladiators on the right side of the relief is a *secutor*, readily identifiable from the long high crest that runs over his egg-shaped helmet. He wears the usual greave on his left leg, tied with bands at the back, and his right arm, with a *gladius* in his hand, seems to be protected by *fasciae*. Only the right arm and hand of his opponent now survive, the relief having broken and being very abraded at this point, but it seems that – as might be expected – this gladiator was a *retiarius*, his trident carried in his right hand along with the short dagger that *retiarii* used for giving the *coup de grace* to their defeated rivals.

8) Another badly damaged funerary monument that may record a gladiator refers to a man whose name was missing from the surviving text, and who achieved at least three victories during his career as either an athlete or as a gladiator.[45] Although the surviving parts of the recorded text clearly leave some room for both restoration and interpretation, it does imply that he died 'away from (i.e., out of) the *stadias*', terminology that is perhaps suited more for a gladiator than for an athlete.

AMPHITHEATRE, THEATRE OR STADIUM?

Gladiatorial contests were clearly held in Ancyra on a probably regular basis from at least the Tiberian period until the early 3rd century, but nothing in the available epigraphic texts hints at where these contests may have taken place. It seems certain that an amphitheatre did not exist here, as none of the early travellers to Ancyra report any

[42] Robert 1950, 41-42, no. 329.
[43] Junkelmann 2000, 114-116.
[44] Cf. Junkelmann 2000, Abb. 173, a relief from Dyrrhachium (Durres).
[45] Bosch 1967, 193-94, no. 152.

physical remains that might belong to such a building.[46] Alternatively, the theatre at Ancyra could have been used for such shows, but there is as yet no evidence to indicate it even existed at the time when the first gladiatorial shows were held at Ancyra, although its near-circular orchestra implies that the masonry structure now visible may have replaced an earlier 'Hellenic' type theatre.[47] More to the point, nothing visible at the site suggests it was provided with the necessary high wall around the orchestra to facilitate its use for gladiatorial events, nor is anything that might relate to such a construction mentioned in the admittedly limited report available for this edifice.[48] In any case, the orchestra seems far too small for the extensive manoeuvring that characterised a gladiatorial fight.

As it is, Roman literature provides an initial clue as to where the earliest gladiatorial contests at Ancyra may have taken place. Thus we learn from a variety of sources how until 50 BC, when C. Scribonius Curio built the first temporary amphitheatre at Rome,[49] such contests took place in any suitable and available open area: the Forum Boarium, for example, was where the first show of this type was held in 264 BC, although later in the Republican period the Roman Forum and then the Circus Maximus became the favoured locations for *munera*.[50] It is quite likely that the earliest gladiatorial games at Ancyra were likewise held in an open area within the *polis*, and if so, presumably its *agora*.[51] Alternatively, they may have been held at any location outside of the core-urbanised area that could be enclosed and provided with seating on a temporary basis for this purpose. Such was in fact apparently done at Antioch in Pisidia, where a temporary wooden amphitheatre stood for two months for a *munus* held there in the later 1st century AD.[52] Indeed, it may well have been that these events at Ancyra took place in temporary structures at the locality named as '*Campus*' in late Roman sources, and which could well have occupied the land for a *hippodromos* that Pylaemenes donated to his fellow-citizens at Ancyra in AD 22/23. To be sure, the '*Campus*' was where at least one Christian martyr met his end,[53] and places set aside for gladiatorial games and the like were frequently chosen for the execution of Christians and other recalcitrants.

In fact recent research has shown that a group of andesite stones currently displayed in the Roman Baths Museum at Ankara almost certainly originated from a purpose-built stadium or *hippodromos*, a place that could just possibly (perhaps) be

[46] The much-pillaged amphitheatres at Anazabarus, Pergamum and Cyzicus show that all traces of such a structure would be almost impossible to obliterate completely – at least before relatively modern times. But note that there is no record of any traces of the amphitheatre reported to have existed at Iconium in the 4th century: Amm. Marc. 14.2.1.

[47] Cf. Bennett 2006, 208-09 with Fig. 3.

[48] Bayburtluoğlu 1987: note, however, a reference there to the possibility that aquatic displays may have been held in this theatre. For aquatic displays in the Roman World in general, including those in theatres, see now Berlan-Bajard 2006, esp. 225-43.

[49] Pliny *HN* 36.117-120; Golvin 1990, 56-7.

[50] Cf., Suet. *Aug*. 43.1.

[51] For the probable location of Ancyra's *agora*, cf. Bennett 2006, 205 with Fig. 1.

[52] Cf. Mitchell and Waelkens 1988, 224-25.

[53] Cf. Mitchell 1982, 104-105.

described as a *campus*. Although these stones are effectively unprovenanced, in the sense that there is no secure record of their find-spot, it has been judiciously argued from the few reports concerning their origin that this stadium may well have been located immediately south of the Roman Baths.[54] More to the point, the use of *stadia* for gladiatorial events is well-attested in Asia Minor, their curved *sphendonai* being admirably suited for the building of a temporary structure to one side to form the necessary elliptical or circular arena.[55] Moreover, as we have seen, the text of one of the gladiators' monuments at Ancyra does indeed refer to a stadium there. To which we might just add that double-ended *stadia*, such as that at Laodiceia, and evidently designed this way for such a purpose, were an architectural conceit first introduced (or so it would seem) in the Augustan period at Nicopolis in Greece, this structure being built soon after the 'Actian Games' were initiated there to celebrate Augustus' victory over Mark Antony and Cleopatra at the Battle of Actium.

Now Ancyra was, of course, an Augustan creation, and had its own version of these 'Actian Games', the *Megala Augusteia Actia*, although when this festival was established at Ancyra is the subject of debate.[56] Even so, it is naturally tempting to associate the place that Pylaemenes provided in AD 22/23 for the *hippodromos* with both the '*Campus*' and this putative stadium, and to go further and speculate that this was where the *Megala Augusteia Actia* and other such festivals, including gladiatorial shows, took place. Whether or not it was a double-ended structure of the type inspired by the stadium at Nicopolis is, of course, impossible to decide from the surviving evidence. It could have been the case that when necessary, the *sphendone* of a normal U-shaped stadium was converted into a temporary timber-built elliptical structure for gladiatorial events, and that over time, as these increased in popularity to the exclusion of traditional Hellenic sporting contests, the *sphendone* was converted to become a stone-built structure of amphitheatrical form, as at Ephesus and several other *stadia* in Anatolia.[57]

DISCUSSION

Over 56 *poleis* in the Anatolian provinces have provided evidence for gladiatorial shows, 32 of them in Asia alone, and the figured and epigraphic evidence suggests that most contests revolved around either a *thraex* and/or a *murmillo*, although *retiarii* are also well-represented in the region.[58] In most cases these shows were, as at Ancyra, presented by the High Priest of the Imperial cult, although other high-ranking officials, such as Asiarchs and Lysiarchs, also promoted them. Indeed, while civic magistrates sometimes

[54] Görkay 2006; cf. Bennett 2006, 213, for the alternative location of the *campus* in the U-shaped valley between the Temple to Augustus and Roma and the theatre.

[55] Welch 1998b, 127-28: the double-ended *stadia* at Laodicea (the *στάδιον ἀνφιθέατρον*) and Aphrodisias both date – in their built-form – to the Flavian period.

[56] Bennett 2006, 201-202.

[57] Cf. Welch 1998b, 122, n. 9, citing other examples at Aphrodisias, Perge, Ephesus, Aspendos, Laodiceia and the Panathenaic Stadium in Athens.

[58] Magie 1950, 655, following the information provided in Robert 1940, 1946 and 1947.

paid for gladiatorial spectacles,[59] it seems that they were primarily connected with celebrations of the Imperial Cult. Moreover, it may well have been the case that each provincial capital had its own *familia* of gladiators and *venatores* for such purposes.[60] There is as yet no direct evidence that such a *familia* existed at Ancyra,[61] but it does seem probable that one did exist. Such is inferred from an inscription of early 3rd century date from Ancyra dedicated to M. Didius Marimus as Imperial *procurator* of Galatia and *pro-tem procurator* of Arabia, and which records among his earlier official posts service as *procurator* of the gladiator schools (*fam(iliae) glad(iatoriarum)*) of Asia, Bithynia, Galatia, Cappadocia, Lycia, Pamphylia, Cilicia, Cyprus, Pontus and Paphlagonia.[62] It seems quite reasonable to assume that these gladiatorial schools were centred on their respective provincial or regional capitals, in which case the Galatia school would be based at Ancyra.

[59] Philos. *Vit. Apoll*. 4.22.

[60] Robert 1940, 240 and 267-75; cf. Mitchell 1997, 110-11.

[61] But note no. 4 above, a relief possibly erected by members of a *familia*.

[62] Bosch 1967, 336-340, no. 276.

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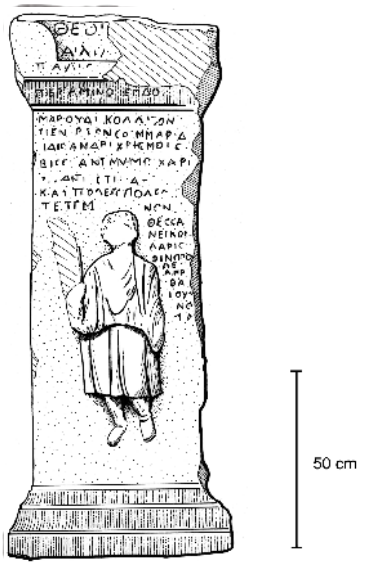

Fig. 1. The *summarudis* Publius Aelius: drawing by B. Claasz Coockson after French 2003, 180-81, no. 69.

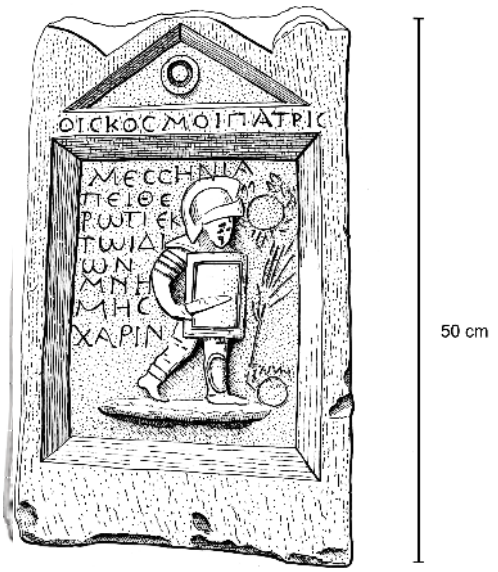

Fig. 2. The *murmillo* Peitheros: drawing by B. Claasz Coockson after Robert 1949, Pl. VIII. 2.

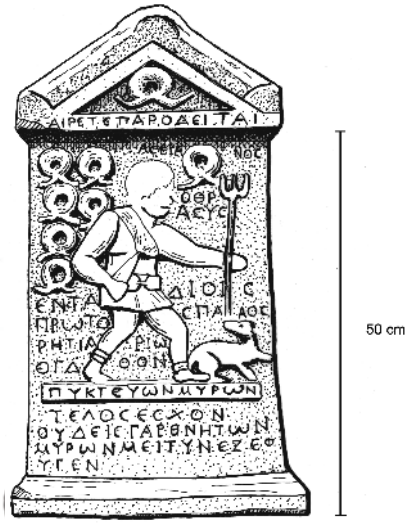

Fig. 3. The *retiarius* Calleidromos: drawing by B. Claasz Coockson after Jerphanion 1928, 270-272, no. 445 and Robert 1948, Pl. X.1.

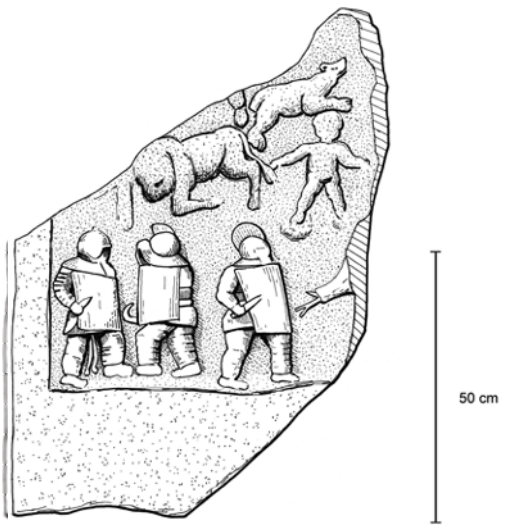

Fig. 4. The *munus* relief: drawing by B. Claasz Coockson after Robert 1950, 41-42, no. 329.

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COINAGE OF JUSTIN II AND ITS IMITATIONS: Historical, Papyrological, Numismatic, and Archaeological Sources[1]

Tasha Vorderstrasse

INTRODUCTION

The Emperor Justin II (565-578) remains, as he was at the time of his own reign, a controversial figure. It is clear from the contemporary and near-contemporary opinions about Justin II that views of his reign varied widely from commissioned panegyrics to highly critical descriptions of his actions, particularly when they were written with the benefit of hindsight. A murky succession, financial troubles, religious persecutions, military defeats (particularly against the Persians), and finally, a descent into madness, helps to explain why many writers were extremely critical.[2] One aspect of his rule that is examined here are his coinage and the subsequent imitations of the coinage in Syria and Palestine in the 7th century. The gold coinage of Justin II was not radically different from that of his predecessors, but it is unusual in that it has attracted the interest of two very different Late Antique writers: Dioscorus of Aphrodito and John of Ephesus. Since coinage was part of everyday life in the Byzantine Empire, they are rarely remarked upon in any detail.[3] These two passages are important not only because they provide an unusual insight into how coinage was perceived by its users, but they also provide an insight into contemporary perceptions of Justin II. This paper, after briefly examining the coinage of

[1] A version of this paper was presented at the *Coinage and Money in the Seventh-Century Near East (10th Numismatic Round Table)* in May 2007. I would like to thank all the participants for their comments and reactions to this paper. A shortened version, entitled "An Overview of the Sources for the Coinage of Justin II and its Imitations," has appeared in *Oriental Numismatic Society* Supplement. See Vorderstrasse 2007.

[2] The historian Evagrius, John of Ephesus (a monophysite imprisoned at the time of the persecutions), Paul the Deacon, amongst others, are extremely hostile against Justin II, while all are universal in their praise of his successor, the Emperor Tiberius. See Evagrius, *Ecclesiastical History* Book V.1-3, 7-11, 13 (and commentary by Whitby in no. 8 and his introduction to the English translation); John of Ephesus, *Ecclesiastical History*; Paulus Diaconus, *Historia Langobardum* Book III.11. The author Menander adopts a more balanced view, initially approving of Justin II's actions but eventually criticizes him for his war with the Persians. See Menander Protector, *History*: Fragment 8 lines 66-68, fragments 9, 1-3, fragment 13, 5, fragment 16, 1 lines 26-28 and 56, fragment 12, 6 lines 79-80 and fragment 15, 1. See also R.C. Blockley's introduction to his edition of Menander Protector, *History*. Liverpool (1985): 23-24. Two other authors are more positive, Agathias (*Histories*: Book IV.21-22) and Corippus (*In laudem Iustini Augusti minori*). Amongst the secondary literature on the historical sources for the reign of Justin II, see Jones 1964: 304-306, 750, 753; A. and A. Cameron 1966a: 101-102; A. and A. Cameron 1966b: 6, 8, 21, 23-24; A. and A. Cameron (1967): 131; McCail 1969: 87, 94-96; Cameron 1970: 6, 11-15, 30, 125; Cameron 1975a: 132; Cameron 1975b: 6, 8-9, 14; Cameron 1976: 161; Cameron 1977: 1-17; Cameron 1980: 64; Harvey 1990; Van Ginkel 1994: 323-333; Whitby 1998: 327; Whitby 2000: 86-90, 92, 94.

[3] For the fourth century, see Themistius, *Or*. 33, 367367b-c. The oration mentions that coins were withdrawn from circulation. Vanderspoel 1995: 49; Penella 2000a: 1-3, 41, no. 159; Penella 2000b: 205-206. For the tenth century, see John Scylitzes who wrote about the emperor John Tzimisces (969-976) who changed the coinage in this period. See Metcalf 1963: 1-2.

Justin II, will examine the two passages in detail, placing them in their historical, papyrological, numismatic, and artistic context. After an examination of the passages, the paper will then look at the imitation Justin II coinage produced in Syria under the Persians and in Palestine under the Muslims and what this tells us about coin circulation.

COINAGE OF JUSTIN II: GOLD AND COPPER

Justin II issued gold and copper coins at a number of mints, following his predecessors. Justin II's gold coinage represents a departure from that of his predecessors, although it conforms in general to types that were popular in the Early Byzantine period. Justin II, perhaps because of the length of his reign, does not vary his obverse types as Justinian did, which showed the emperor in a variety of poses. Justin II's solidi (Fig. 1), struck between 565-578 at Constantinople, Alexandria, Carthage, and Ravenna, show himself on the obverse (sometimes with a short beard), wearing a cuirass and a helmet with plumed diadem pendilia and trefoil ornament. In his right hand he holds a globe surmounted by Victory who crowns him with a wreath. On his left shoulder there was a shield with traces of a horseman device and loop of top. The inscription on the reverse reads: DNI VSTI NVSPPAVI.[4] It is on the reverse, however, where the real innovation occurred, which became the subject of so much comment by John of Ephesus (see below). On the reverses of Roman and Late Roman coinage, it was common to see geographical personifications of cities, but these geographical personifications had disappeared after the reign of Anastasius. The coins from the reign of Justin II, however, brought this geographical personification back to the coinage. On the reverse of his solidi, Constantinople is seated right, with a helmet, tunic, and mantle. On her right shoulder is an aegis and with her right hand she leans on a spear. In her left hand she holds a globe with a cross on top. The inscription reads VICTORI AAVCCC with CONOB in the exergue.[5] Generally, the reverse has been interpreted as a geographic personification of Constantinople, although Vermeule suggested that it was Rome, because of the prestige of the city.[6]

Justin II's copper coins also offer an innovation, this time on the obverse (Fig. 2). The usual practice since the Roman period was to depict the bust of the emperor. In some instances, other members of the imperial house would be depicted. Since the early 5th century, however, it was not usual for other members of the emperor's family to feature on coins. Further, only the bust of the emperor was shown. The reign of Justinian I, however, had ushered in a number of changes to the depiction of the emperor on coins. While the emperor was still depicted alone on coinage, it is true that he was no longer depicted only in bust form. A new coin type was ushered in: an effigy of the emperor Justinian sitting on a throne. It is likely that this is the type that was copied by Justin II

[4] *DOC*: 1-11 (Constantinople mint), 138-142 (Antioch mint), 187 (Alexandria mint), 190 (Carthage mint), 210 (Ravenna mint).

[5] Toynbee 1953: 261, 269, 277, no. 124.

[6] Vermeule 1959: 47-48.

when he ascended the throne. When his coinage was issued, however, Justin II had added to the innovation of a full frontal effigy. In this instance he issued a coin showing him with his wife Sophia.[7] This represented a change from the past, one which would have been evident to everyone who used the coins, whether they could read the legends on the coinage or not.

COINAGE OF JUSTIN II IN DIOSCORUS OF APHRODITO

In addition to the coins themselves, there are also descriptions of the coinage. The panegyric poem[8] written by Dioscorus of Aphrodito in honor of Justin II's accession to the throne is an important source for coinage. Dioscorus had been born in approximately A. D. 520, the son of Apollo, who had been a *procanetes* of Aphrodito and later became a monk. It is not clear where Dioscorus studied (perhaps in Alexandria), but he received a good education in law and the Classics. He became a lawyer and was heavily involved in a land dispute involving his village, which meant that he had to journey from Egypt to Constantinople. Then, in 565, Dioscorus moved from Aphrodite to Antinoe, the seat of the Duke of Thebaid, where he hoped to establish himself as a jurist and a poet. Therefore, he was living in Antinoe when he wrote the text that concerns us here. His attempt to establish his career was not entirely successful, however, because by 573 he had returned to Aphrodito and his last dated work can be assigned to Year 3 of Maurice. His writings were extensive and include a Greek-Coptic glossary, poems, petitions, business contracts, and panegyrics, much of it preserved in the draft stage.[9] Dioscorus' work, particularly that which exists in Greek has been studied extensively by papyrologists, but his Coptic output has received less attention. His literary output has received a very mixed review, primarily negative,[10] and the significance of these texts has largely been ignored. Recent

[7] *DOC*: 22-58 (copper from Constantinople), 64-85 (copper from Thessalonica), 92-115 (copper from Nicomedia), 117-135 (copper from Cyzicus), 150-160, 162-173, 175-184 (from Antioch), 197-201 (Carthage, busts only), 202-203 (full effigies from Carthage). See Brubaker and Tobler 2000: 583-586, who call attention to the continuation of the practice of placing the emperor's wife with him on the coins in subsequent reigns. They state, however, that during the reign of Tiberius II, only on the half-folles of Thessalonica is the emperor depicted with his wife, and then, only in the mint during 579. If one examines the *DOC* catalogue, however, one can see that the half-folles continued production until the end of the emperor's reign in 582. See *DOC*: 23-26.

[8] Cameron 1975: 159; T. Viljamaa 1968: 7-9, 19-20.

[9] Bell 1944: 24-25; Baldwin and MacCoull 1991: 633; Fournet 1999: 259, 320-321.

[10] Maspero notes the "jargon grotesque" and "composés ridicules" of Dioscorus. See Maspero 1911: 472; Bell and Crum 1925: 177. Bell and Crum write "...his personality, as revealed in the documents he has left us, certainly does not inspire respect, and his verses indubitably merit damnation; but his services to papyrology are immense... his verses, if infamous as literature, are at least of interest as illustrating the morass of absurdity into which the great river of Greek poetry emptied itself."; Bell 1944: 27-28. Bell notes the "series of fantastic compound words" in the text and states that "Vain, pompous, self-important, ridiculous in the extravagant floridity of his literary style... he can claim, for what it is worth, the distinction of having produced what are probably the worst Greek poems which whimsical Fortune has preserved for us from the wreckage of Greek literature... when he [Dioscorus] ventured... to coin new words, his ignorance of etymology and his very uncertain understanding of his literary models produced alarming results... Dioscorus' ambitions were unfortunately an excess of his powers [as a poet]..."; Viljamaa 1968: 32. "Dioscorus' verses are in the nature of rough drafts and are so poor that they can hardly be called poems. They are, however, of interest to literature insofar as they typify, poor though they may be, the kind of poetry which antiquity was capable of producing in its dying years."; Al. Cameron 1970: 121-122 criticizes Dioscorus' work which he refers to as "poems" rather than

scholarship, however, has recently begun to situate his work in its context, rather than to simply compare it to Classical Greek poetry.[11]

Dioscorus' short poem (*chairetismos*) in honor of an unknown emperor (P. Cair. Masp. 67097 verso, F, 17-29) (Fig. 4), has been published several times and caused particular consternation for scholars. The poem's meaning has been debated since it was first edited by Maspero. The general agreement is that it was written in honor of an emperor, but it is here that exact meanings and opinions diverge. As no emperor is mentioned in the papyrus, and no date given, there is a lack of agreement about when the papyri should date to in addition to what the poem actually means. The relevant part of the text here is as follows:

Χαῖρε, ὀλοκοττινοπερίπατε ἀγγελοπρόσωπε,

χαῖρε, κ(ύρι)ε, χρυσαργυροπιναροσμαραγδομαργατοβελτίων,

χαῖρε, δέσπ(οτα), χρυσολιθοκαχατωνύχιε, πρα[σ]ινοπάντιμε, λαμπροβ…[12]

The first problem with this text is when it was written. Since no emperor is mentioned in the poem, the emperors Justinian I, Justin II, and Maurice have all been mentioned by authors as possible candidates for the poem, with authors suggesting the reign of Justinian (Maspero),[13] Justin II (MacCoull, Fournet, and Bell)[14], or Maurice (Baldwin and Kuehn).[15] Saija, who was written extensively on Dioscorus, does not give a date for the work.[16] Maspero, Baldwin, and Kuehn all use internal evidence from within the poem in order to date it and ignore the evidence from the papyri itself. The key to the dating of poem, however, rests on the other texts on the papyrus that do have dates. The texts must all be considered together in order to arrive at a date. First, there are two

poems, implying their lack of worth. He goes further in Al. Cameron 1965: 509 where he states: "But Dioscorus was a Christian, and sadly deficient as his poems are in respect of grammar, metre, style, and content alike, they are in fact the clearest proof that the flame had already gone out." Baldwin describes it as a "piece of polysyllabic doggerel." See Baldwin 1981: 285. Later he states: "By common consent of those few who have studied him, Dioscorus *is* the worst poet of antiquity... Up to a point – one, I admit, that may be reached with uncomfortable swiftness – this is unfair." He concludes the article with: "Preliminary work on a fuller study of Dioscorus' language makes me suspect that he had his moments... This notwithstanding, Dioscorus will for most remain a footnote in literary history; but one that, as I hope to have shown here, innocently provides many footnotes of his own for the student of early Byzantine language and literature." See Baldwin 1984: 327, 331. Even recently, Dioscorus' poetry has received negative reviews. Kuehn states that the poem is a "white elephant." See Kuehn 1995.

[11] MacCoull 1981: 43-46, particularly 45, 46, no. 8; Saija 1989: 61-62; Kuehn 1995: 50-51, no. 50; Liebeschuetz 1995: xxi; Alston 2002: 328.

[12] The text is reproduced here from Fournet 1999: No. 40. The *editio princeps* is *P. Cairo Masp*. I 67097. The text also appears in Maspero 1911: 444-445; Baldwin 1981: 285; MacCoull 1981: 43; Saija 1989: 61-64. For individual words see Saija 1995: 13, 159, 241-242.

[13] Maspero 1911: 445, no. 3. Maspero argues that there is a reference to the Greens and therefore dates the poem to the time of Justinian, who favored the greens.

[14] Commentary by Bell on *P. Lond. V*. 1674, 57; Bell 1944: 28; MacCoull 1981: 43-46; Fournet 1999: 648.

[15] Baldwin 1981: 285-286. He bases the date on the idea that the reference to the Greens must date the poem to the time of Maurice, who was a follower of the Greens. He states it cannot be Justinian, as Maspero suggests, because he was a follower of the Blues. Kuehn 1995: 82, no. 26. He suggests that the poem was written after 582 and before 585 under Maurice during monophysitic persecutions. See discussion of this below.

[16] Saija 1989: 61-64.

definite dates that appear on the papyrus. The first is on the recto, which is a sale of land written on the vertical-fibers side that mentions a 5th indiction. After this contract was written, Maspero notes that the top and bottom of the papyrus were cut off and then the horizontal fibers side of the verso was used (which is contrary to usual practice). Then on the verso, a payment of grain is recorded for the 7th indiction (*P. Cair. Masp.* I 67097 A).[17] In addition to the evidence from the dating from the papyrus itself, there is also internal dating based upon the other poems in the papyrus (*P. Cair. Masp.* I 67097 E and B-C and F 1-16) which should be assigned to Duke Athanasius (*P. Cair. Masp.* I 67097 E and B-C mention Athanasius by name, but F 1-16 does not).[18] Fournet argues that *P. Cair. Masp.* I 67097 E and B-C dates to the accession of the new duke is related to *P. Cair. Masp.* I 67097 F 1-16, because this text is an elegy petition addressed to a new duke. He suggests that these poems, as well as the poem under consideration here, and the *encomium* for the *adventus* of Justin II (*P. Cair. Masp.* II. 67183), were all written at the same time. Therefore, the verso of the papyrus (with the exception of the payment), were written all at the same time, when Athanasius first became duke, and he was in power from 565/566-567/8.[19] This works very well with the beginning of the reign of Justin II. In addition, Dioscorus wrote a poem in honor of Justin II, the only poem he wrote where an emperor was mentioned by name. This is again thought to be written at the same time as this text, for the *adventus* of Justin II.[20]

Therefore, according to Bell (and followed by Fournet), the 7th indiction mentioned in the first part of the verso should date to 558 (that is, the 7th indiction of Justinian) rather than 573 (the 7th indiction of Justin II). This is because the subsequent mention of Athanasius in the text means that it cannot be post-Athanasius. In addition, none of the other documents written by Dioscorus in Antinoe date to later than A. D. 570 and we know that Dioscorus was back in Aphrodito in 573, again arguing against the 7th indiction of Justin II. Further, both *P. Cair. Masp.* I 67097 A and the recto were written in Aphrodito and the following part of the papyrus relates to the poems written for the succession of Athanasius and the *adventus* of Justin II, which occurred when he was in Antinoe.[21] Bell's argument was apparently not seen by MacCoull, who believes that the verso of the text must date to 571 and the recto must date to 573/574. She is aware of the fact that Athanasius is not Duke of the Thebaid in 573, but suggests that the papyrus was brought back by Dioscorus to Aphrodito and re-used.[22] This would assume, however, that he did not write the texts on the papyrus in sequential order. In order to escape the problem of when Dioscorus was in Aphrodito or in Antinoe (as alluded to by Bell), Kuehn argues that the recto of the papyrus was written not by Dioscorus, but by a clerk.

[17] See Maspero's comments on *P. Cairo Masp.* I 67097, 140. See MacCoull 1988: 112-113; Fournet 1999: 390.

[18] See Bell's commentary on *P. Lond. V.* 1674, 57; MacCoull 1981: 46, no. 7; MacCoull 1988: 112-113; Fournet 1999: 113-115, 390, 509.

[19] Fournet 1999: 330-332, 509-510, 646.

[20] MacCoull 1984: 575-585; Fournet 1999: 113-115, 409, 567.

[21] Commentary by Bell on *P. Lond. V.* 1674, 57; Fournet 1999: 390. For the indiction dates see Bagnall and Worp 2004: 150-151.

[22] MacCoull 1981: 46, no. 7; MacCoull 1988: 112-113.

He states that Athanasius cannot be Duke Athanasius because he was out of office by the 570s. Although he admits that it is possible that the papyrus dates to the earlier indiction, he refuses to believe it is so, because he is convinced that the text must date to the time of Maurice (see above).[23]

It is widely accepted that the poem was composed in honor of the *adventus* of the emperor's effigy,[24] even if the authors do not always agree which emperor's effigy is being honored. Effigies or depictions were seen as embodiments of the emperor when he could not be present in a particular location. When effigies arrived at a particular city where they were formally acclaimed and displayed in public. The *adventus* ceremony can be traced back to the Roman period when it had a sacred character and often the ceremony was commemorated on money. The ceremony was altered considerably in the Late Antique period as Christian emperors adapted it for their own use, but it remained an important civic ceremony with political overtones. Statues and depictions of emperors continued to be acclaimed and hailed in different cities throughout the Byzantine empire as if they were the emperors themselves.[25] There is no indication of the type of depiction that arrived at the *adventus* in Antinoe, but we have some indication of the types that might have been used. The consular diptych of Justin II's cousin Justin[26] or the 5th century statue in Barletta[27] could give an indication of how a statue of Justin II might have appeared. Another possibility, of course, is that a portrait was sent, which is the idea suggested by MacCoull.[28] There is the portrait of Patriarch Theophilus of Alexandria on papyrus[29] and the votive icon of Bishop Abraham of Hermonthis (painted late 6th century) would have been the subject of veneration.[30] This is an Egyptian image and is rather crude, but it could give an indication of the appearance of the emperor's portrait in a small town such as Antinoe. Indeed, painted images are known from Antinoe itself. The excavations have revealed a number of portraits that were probably pained to depict specific holy individuals after their death.[31] It is also possible that not only a statue of Justin II arrived at Antinoe, but also one of Sophia. This would not be surprising. In Rome, for example, citizens welcome the *adventus* of the images of both the new emperor Phocas and his wife Leontia.[32] In contemporary descriptions of statuary of Justin II, his

[23] Kuehn 1995: 80, no. 12, 81, no. 15, 82.

[24] Maspero 1911: 472; Kruse 1934: 41-42; Bell 1944: 28; Saija 1989: 61-62; Baldwin and MacCoull 1991: 633; Fournet 1999: 648. MacCoull, however, does not address why the poem was composed. See MacCoull 1981: 43. Baldwin states it is written to an imperial statue, but does not address the question of the *adventus*. Baldwin 1981: 285.

[25] Viljamaa 1968: 22, 25, 29, 32; MacCormack 1972: 720, 725, 743, 746-747, 749; Barnard 1973: 24-25; Barnard 1974: 74-75; Cameron 1979: 33; MacCormack 1981: 6, 18, 67, 81; Chauvot 1986: 98; Cameron 1987: 107; Dufraigne 1994; van Nuffelen 2002: 264; Török 2005: 300.

[26] Krause 1971: 106-111; Breckenridge 1979: 51; Effenberger and Severin 1992: 138.

[27] Elsner 1998: 75, Fig. 48.

[28] MacCoull 1981.

[29] This image comes from Papyrus Goleniščev, papyrus codex, fol. 6v. See Elsner 1998: 257, Fig. 162.

[30] Effenberger and Severin 1992: 170; Török 2005: 301-302.

[31] Salmi 1945: 157-169; Weitzman 1979: No. 496, 551-552; Rassart-Debergh 1990: 58-59; Rassart-Debergh 1993: 321, 327; Del Francia Barocas 1998: 97-99.

[32] Barnard 1973: 24-25.

statue is almost always twinned with one of Sophia and occasionally, there is also a statue of their daughter Arabia.[33]

At the *adventus*, the statue would be acclaimed and Dioscorus' text would have been given for this purpose, much as Corippus wrote about Justin II in Constantinople. Corippus wrote a richly worded panegyric that celebrates Justin's accession to the throne reflecting the image that Justin II himself was trying to project, rather than the one that is seen by the other authors, as a representative of God on earth.[34] Corippus' real attitude about the emperor is, however, impossible to determine. Equally, the fragment of Dioscorus' poem in honor of Justin II, much like his panegyric written for the same emperor, is filled with high praise and similar metaphors. Again, Dioscorus' true attitude about Justin II is impossible to determine. In both instances, the purpose of the poetry was to praise the emperor. The way that the poem was written also had the function of providing Dioscorus an opportunity to show off his learning by composing the long compound words inspired by Aristophanes and other comic authors as well as the poetry of Constantine the Rhodian (which have subsequently been the cause of so much ridicule).[35] Therefore, the purpose of the poem was to emphasize to the listeners not only the greatness of Justin II, but at the same time, the learned background of Dioscorus. Even if the listeners did not know the exact sources of inspiration used by Dioscorus, the words that he invented would have doubtless produced quite an effect.

The first line is the one that is of the most interest for the present article. Again, however, the interpretation of this line is not straightforward. Literally, the poem hails "Hail, you-whose-angelic-face-that-circulates-on-the-gold-coin."[36] The question, however, is what Dioscorus is actually referring to. Not surprisingly, opinions are various. Most scholars agree that Dioscorus was referring to the coin, with the exception of Maspero, who thought it meant a statue[37] and Kuehn, whose opinion is discussed below. MacCoull believes that the "angelic visage" refers to the reverse of the coin, which depicts Justin II facing the audience. Such a solidus would have been impressive to the viewer when it circulated in Egypt.[38] Neither Saija[39] nor Baldwin directly addresses whether or not the description refers to the obverse or the reverse of the coin, although Baldwin notes that it refers to the emperor's features,[40] which suggests he believed that the poem was describing the obverse of the coin. Interestingly, Fournet adopts a different point of view. He argues that the term is referring to the angels that sometimes appear on the reverse of

[33] Cameron 1980: 70-71.

[34] Corippus, *In laudem Iustini Augusti minori*. Cameron 1975: 132; Cameron 1979: 12; Cameron 1980: 62, 64; MacCormack 1981: 78; Olster 1993: 144-147, 149. See also commentary of A. Cameron accompanying her edition of Corippus. *In laudem Iustini Augusti minoris*: 5-7.

[35] Maspero 1911: 472; Bell 1944: 27-28; Baldwin 1981: 285; Saija 1989: 61-62; Fournet 1999: 648.

[36] Maspero 1911: 445.

[37] Maspero 1911: 472.

[38] MacCoul 1981: 44.

[39] Saija 1989: 62.

[40] Baldwin 1981: 285.

some coins.[41] Justin II's coins do not have an angel on the reverse so it is unclear why Fournet thinks it is the reverse that is being referred to here. Fournet's suggestion is possible if one assumes that Justin II's gold solidi had yet to reach Antinoe and Dioscorus was using Justinian's reverse solidi type as a reference, not realizing that the new innovation would appear.[42] If one compares the poem to Corippus, it is unlikely that Dioscorus was referring to the reverse of the coin, however. The two descriptions are rather similar. Corippus describes Justin II as follows: "his appearance surpassed gems and gold, his angelic eyes equalling the stars in heaven."[43] It makes more sense to read the first line as a reference to the obverse of the gold coins (hence the angelic face) rather than to an angel on the reverse.

Recently, a radically different point of view about Dioscorus' poem has appeared. Kuehn has argued that the poem is actually a satirical monophysite text that criticizes icon worship. The reason he believes that it is written in such a way was because Dioscorus feared persecution for his views. Therefore, the poem does not praise images or a specific event, but rather it is addressing icons and criticizing icon worship. Since it is an iconoclastic poem, he argues that it must have been written between 582-585 and must have circulated because there are later Chalcedonian replies written in Palestine to it.[44] This seems unlikely, however. While it is true that the complex words found in his poem first appeared in works like Aristophanes/Lysistratus, there is nothing that suggests that it is satirical here. Dioscorus might have simply been demonstrating his knowledge of Classical authors or his ability in Greek to his audience. There is absolutely no evidence that this is a satirical monophysite text or that it circulated so widely that later scholars in Palestine were busy composing replies to it. Therefore, Kuehn's suggestions about the purpose and dating of this text must be ignored.

[41] Fournet 1999: 649.

[42] The numismatic evidence from Antinoe is problematic as the evidence from Gayet's work in the cemeteries of Antinoe in the early part of the 20th century have not been published, except for a few examples. Del Francia Barocas 1998: 58. The excavations by the British did not reveal any hoards that might indicate gold coins were circulating at the site. Further, there is no gold hoard evidence to provide an idea of what types of coins were circulating in Antinoe in this period. See Milne 1947: 108-114; Noeske 2000: 359-365. There may be some indication of the gold coins that were in circulation in Antinoe if the attribution of a jewelry hoard to Antinoe is correct. According to the scholars who have studied this hoard, it was found either at Antinoe or near Asiut. The jewelry hoard includes bracelets, necklaces, and belts, although it should be noted it cannot be proved that all of the jewelry comes form the same find. Several of the pieces of jewelry included coins in their decoration and these coins can give an indiction of what was used at the time. The coins were taken out of circulation and made into jewelry, therefore converting them into decorative items that were also a store of value. Several of the pieces include coins and of these, two of them have Justin II gold coins as decoration. There is a pectoral which is decorated with 1 coin of Justinian, 5 coins of Justin II, 1 of Tiberius, and 4 of Maurice. All of these coins were minted in Constantinople. The other object was a gold medallion decorated with one coin of Justin II, also minted in Constantinople. See Dennison 1918: 97-98, 103-104, 121-122, 137.

[43] Corippus, Book IV, 245-246: "et sacri luminis instar illius aspectus gemmas vincebat et aurum, angelicis oculis exaequans sidera caeli."

[44] Kuehn 1995: 77-79, nos. 2, 4, 82, no. 26, 91, 94, 96-97, no. 77, 98-100, 102, 128, 135, 154, 233, 236, 240-242.

COINAGE OF JUSTIN II IN JOHN OF EPHESUS

The other author to discuss Justin II's coinage is John of Ephesus. This text has received considerably more attention from numismatists and historians, but it has not been discussed in detail.[45] John of Ephesus was a monophysite born near Amida (modern Diyarbakir) in ca. 507, became a monk and was ordained in 529 as a deacon. He settled in Constantinople and like other monophysites, enjoyed the protection of the Empress Theodora and was close to the Emperor Justinian. He traveled widely in Asia Minor and claims to have converted pagans there (his claim that he baptized 70, 000 pagans is perhaps somewhat exaggerated). After the death of Justinian, however, this situation changed and John was imprisoned in 571 and was only released after Tiberius acceded to the throne in 574. He was banished again, however, and died in Chalcedon some time between 586 and 588. John of Ephesus was a staunch critic of Justin II and this strongly affects his descriptions of Justin II's life and rule which are extremely inflammatory, although it does provide an insight into Constantinopolitan affairs. He argued emperor went mad because of his persecution of monophysites and that when Justin II was mad that he would bark like a dog, bleat like a goat, hide under beds, and try to throw himself out the window. It was, however, possible to put his throne on wheels and move him about the palace! One or the reasons that he greatly disliked Justin II is that he had been imprisoned during Justin II's persecutions against the Monophysites. He claimed that Justin II was being punished for his many sins by the madness that had been visited upon him. John of Ephesus lived in Constantinople, and unlike Dioscorus, knew both Justin II and Tiberius (whom he greatly admired).[46]

Therefore, it should perhaps not be considered surprising that the passage of John of Ephesus that discusses the coins of Justin II would be critical:

> For Justin had introduced of his darics a female which was compared to Venus and this Tiberius discontinued and had a cross struck upon the reverse of his coins and this act, as he himself said, was dictated to him in a vision. [47]

This passage seems to have two aims. The first is to criticize Justin II for his choice of coin design. It is unclear whether or not John of Ephesus knew who the figure on the coin was supposed to be or not. The passage seems to be another example of how Justin II made things go badly wrong (issuing coins that appeared to be pagan) that were unpopular with the people. Of course, it was then necessary for Tiberius to come in and save the

[45] *CMB*: 124; Cameron 1975: 129-130; *MIB* 2: 37, no. 1; Grierson 1982: 35, 52.

[46] Cameron 1976: 162; Cameron 1977: 11; Cameron 1980: 64-66; Allen 1981: 26, 41-42, 209-210; Griffith 1991: 1064; Witakowsk 1987: xv-xvi, xxvi, xxvii; van Ginkel 1995: 27-37, 108; Ironically, one of the virtues of Justin II listed by Corippus is that the emperor had "prudens consilium" or "sound judgement" and "stabilis mens" or "a stable mind." See Corippus. *In laudem Iustini Augusti minori* Book I. 50. For a brief analysis of John of Ephesus attitudes towards emperors see van Ginkel 1994: 323-333.

[47] John of Ephesus, *Ecclesiastical History Part III*. Book III, Chapter 14, 140. The main edition is by Brooks (1952). A Latin translation accompanies the Syriac. The English translation of John of Ephesus by Payne-Smith is now available on the world wide web. See www.ccel.org/p/perse. See also Cameron 1975: 129-130; Grierson 1982: 35, 52; Cameron 1980: 83. For the *Ecclesiastical History*, in general, see van Ginkel 1995: 70-85.

situation by removing the offending figure and replacing it with an unmistakably Christian cross. The intended audience for John of Ephesus' history is rather different than Dioscorus' audience. It was not composed for a special occasion, nor was it made for a Greek-speaking audience. The fact that John of Ephesus wrote in Syriac makes it likely that his intended audience were Syriac speakers from the eastern part of the empire,[48] who were Monophysites and would have agreed with the strong opinions expressed in John's book.

It is difficult, however, to know if this accusation is true or not[49] for the simple reason that John of Ephesus hated Justin II so much. Still, his hostility towards Justin II does not mean that he was necessarily lying.[50] What is clear, however, is that this innovation did not last. Many aspects of Justin II's coinage did not survive his death, although they did not all disappear entirely. One innovation that Justin II had begun was to depict himself with his wife Sophia on the copper coins. After he died, subsequent rulers did also depict themselves on coins with their wives. Indeed, copper coins of Justin II apparently circulated in large numbers and were subsequently imitated in the Early Islamic period. The reverse on his gold solidi, however, disappeared entirely, which argues that it was not popular, as John of Ephesus had indicated. It is possible that the subsequent emperors wished to emphasize their Christian rather than Roman heritage and therefore ceased to mint coins of this type, rather than that the population objected to them so much. In an ideal world, of course, someone like Justin II would have doubtless preferred a Christian image over the more "pagan" personification of the city. Nevertheless, there continued to be depictions of Constantinople[51] and Venus is also depicted in this period[52] – clearly there was a demand for classical figures, at least amongst some members of the population. Interestingly, the two do not resemble each other and therefore it is unlikely that anyone would mistake one for the other.[53]

If John of Ephesus was correct that the population objected to the gold coinage, one would expect not to find it in use. In Egypt, for example, Justin II coins are found in hoards, and numbers reach a high point under Tiberius II, then under Phocas.[54] In the Balkans and Asia Minor, Justin II gold coins also appear in hoards.[55] Therefore, it was clear that Justin II coins were not shunned by the population. If people objected to them so much one would expect them to be melted down and re-coined but this is clearly not the case. Further, they continued to circulate after his reign, as the composition of a

[48] van Ginkel 1995: 97.

[49] See Cameron's commentary on Corippus. *In laudem Iustini Augusti minori*. Book I. 288-9.

[50] Cameron 1975: 17-18; Cameron 1977: 9.

[51] Weitzman 1979: 140-141, 173.

[52] One example may come from Egypt. This is a gold necklace in the Dumbarton Oaks collection with a lapis lazuli pendant mounted with a gold figure of Venus. See Ross, Zwirn, and Boyd 2005: 18, Cat. no. 12.

[53] For a number of examples see, Weitzman 1979: 137-138, 313-314; Leader-Newby 2004: 174-175. The continuance of Hellenistic motifs should not be considered surprising. Hellenistic style art continues in Egypt into the Early Islamic period, see MacCoull 1986: 230-234 ; Fournet 1993: 237-244; Török 2005: 351-358 (who objects to the dating of the piece by MacCoull but is apparently unaware of Fournet's work). See, in particular, van der Vliet 2007: 77-80. I would like to thank J. van der Vliet for providing me with an advance copy of this article.

[54] Noeske (2000): 293 (Band I), 15 211, 243-244 (Band II).

[55] Morrisson, Popovic, and Ivanisevic 2006: 130, 181, 209, 214, 245, 264, 268, 278, 324-327.

number of the hoards attest. The population did not cease using them after the reign of Justin II, his coins continued to be hoarded as a store of value.

JUSTIN II IMITATION COINS UNDER PERSIANS AND MUSLIMS

While the innovations of Justin II's gold coinage may have had a rather short life, his copper coinage fared rather better. Not only did official Byzantine rulers after Justin II begin to depict themselves with their wives on the obverse of coins,[56] his copper coins were also widely imitated. The imitation coinage of Justin II can essentially be divided into three categories: contemporary imitations, Persian imitations, and Arab-Byzantine imitations. It is clear that Justin II coins circulated in the region and these distinctive coins were copied by a variety of different minters in Anatolia and the Levant (see discussion below).

The first imitations discussed here are the so-called Justin II military mint coins. These were first identified by Bellinger as the "Constantine in Numidia" coins, a suggestion that was apparently followed by Grierson.[57] In the publication of the Sardis publication, Bates states that he is inclined to accept Bellinger's hypothesis but he is "disturbed to find four of them appearing at Sardis,"[58] while only two coins from Carthage have been found at the site. He argued that one possible explanation is that the coins were brought back from troops returning from North Africa, following Grierson's suggestion in Bellinger's *DOC* note that they were struck at army posts in North Africa for payment of troops and that the Constantinople mintmark might be the result of copying imperial coins.[59] There is no indication that any coins were minted at Constantine in Numidia and neither Morrisson[60] nor Hahn[61] believe that the coins were minted at the site. The distribution of the coins is interesting. Hahn suggests that the coins were struck at a variety of military mints,[62] a suggestion that has been followed by Pottier.[63] The majority of these coin types have not been found in archaeological excavations, however. These types still need to be studied further in order to better understand where they were found in general. Hahn reports that one was found in the Perge excavations (unpublished) and similar types appear in Crete (he does not mention whether these were excavated or not), and one from a private collection allegedly found in Silifke. Some have also been found in hoards in Greece and the Balkans. It remains to be seen how these are to be

[56] Brubaker and Tobler 2000: 583-585.

[57] Bellinger 1966: 99-106; *DOC*: 204-205. Grierson's ideas are given in Bellinger's footnotes to the coins in *DOC*. In this, it is stated that Grierson thinks that the coins are "probably western."

[58] Bates 1971: 10.

[59] Bates 1971: 10.

[60] *CMB*: 156, no. 1; Morrisson 1988: 427, no. 10.

[61] *MIB 2*: 46, 49-50.

[62] *MIB* 2: 46, 49, no. 90.

[63] Pottier 2004: 70, 81.

connected with the examples in the Syrian hoard published by Khirbet Deir Dassawi hoard in Israel and in the Syrian hoard by Pottier.[64]

In the Persian period, there were a number of coins that were struck imitating the copper issues of Justin II from Nicomedia (Fig. 3a). These Persian period coins have been thoroughly discussed by Henri Pottier in his book. These pieces are not present in hoards in the 6th century, which would argue that they were later imitations and pieces are distinct from the coins minted under Justin II at a military mint on the basis of style and weight. Pottier has shown that they appear in the Tell Bisa hoard as well as the hoard published by Metcalf has convincingly argued that one of the coins in the Apamea excavations should actually be identified as one of these coins. The fact that the coins are not found widely in excavations is not surprising. Imitation Persian coins have only been identified at a few excavations and we await further study of the Antioch excavation material for more potential information. The current evidence, however, demonstrates that these coins have a Syrian provenance.[65]

In addition to the imitation coins that were imitated by the Syrians under the Persians, there are also coins which were minted in Palestine in the Early Islamic period, which were imitating the copper coinage of Justin II and Sophia (Fig. 3b). The Arab-Byzantine coins were struck in the jund of al-Urdunn at the mints of Scythopolis, Gerasa, and possibly Abila and were derived from the folles of Justin II and Sophia struck at Nicomedia. The obverse have two imperial figures with the name of the mint in Greek (often wrong) and reverse have M with a fossilized mint mark in exergue which is usually Nicomedia, but it occasionally Constantinople and Cyzicus. The first mint that was identified is Scythopolis which is the best known of the mints that produced imitation Justin and Sophia coinage identified so far. The other mint is that of Gerasa which was only recently identified and another possible mint may be at Abila.[66]

These coins were first brought to the attention of scholars by Bellinger in his study of coins from the Jerash excavations. It is clear that these coins are copying the earlier Byzantine types and there is a very good reason for this**.** Over 40% of the Byzantine coins from the site came from the reign of Justin II, a number which Bellinger termed as "remarkable." The mint most represented was Constantinople, but Nicomedia only lagged behind by one coin. Bellinger stated: "The most remarkable thing about the series is the extraordinary number of coins of Justin II and particularly the place occupied by Nicomedia."[67] He noted that there was no historical reason to explain why so many coins of Justin II were found at the site and argues that perhaps some condition brought Palestine and the territory across Jordan a large number of Justin II Nicomedia coins.[68] In his article on coin frequencies in sixth and seventh century Syria Walmsley notes that a similar spike in coin numbers at Pella, where once again, Justin II coins dominate. At

[64] *MIB* 2: 46, 49, no. 90; Pottier 2004: 69-70, 81; Morrisson, Popovic, and Ivanisevic 2006: 206, 210, 246, 291, 327.
[65] Pottier 2004: 69-81.
[66] Naghawi 1989: 219-222; Oddy 1994: 408-409; Album and Goodwin 2002: 87; Pottier 2004: 82-83; Oddy 2004: 137.
[67] Bellinger 1938b: 499. See also Bellinger 1938a: 13-14, 103-113; Oddy 1994: 441.
[68] Bellinger 1938a: 13-14; Bellinger 1938b: 499; See also Oddy 1994: 441.

both sites, many coins come from the Nicomedia mint. He suggested that Nicomedia may have been the main mint supplying the region.[69]

Further, evidence from excavation work by the Spanish at Jerash also reported a large number of Justin II coins in proportion to other Byzantine rulers,[70] once more echoing the other results. The 1983 excavations reported a majority of the coins came once again from the Nicomedia mint,[71] but this is not the case of the more recent Spanish excavations. The majority of the coins come from the mint Constantinople (18 examples), followed by Alexandria (11 examples), and only then Nicomedia (10 examples).[72] This is interesting because it is not echoed in the other excavations at the site, suggesting that where one excavates on Jerash determines the mint, rather than it is a pattern across the entire site. Outside of Jerash and Pella, the Amman hoard shows a similar pattern to the majority of the excavations of Jerash and Pella, that is a large number of Justin II coins and the majority from the Nicomedia mint.[73] Large numbers of Justin II are also seen at smaller sites such as at Tell Jezreel (near Beth-Shean)[74] and Capernaum,[75] but the patterns are similar to the more recent Jerash excavations. The majority of coins in both instances were minted in Constantinople.

The presence of the imitations means that it is clear that the coins continued to circulate into the Early Islamic period. Further evidence is presented by the presence of Justin II coins in later hoards. In the hoard published by Bates and Kovacs, the largest number of Byzantine coins represented are those of Justin II, almost half of which are minted in Nicomedia. This hoard indicates that Justin II coins were continuing to be used in large numbers in the Early Islamic period in this part of the region,[76] probably because there had been so many coins imported in the first place. This is also indicated by the presence of the Arab-Byzantine coins copying the issues of Justin II. Bellinger found it surprising that the coins were circulating nearly sixty years after they were used. He suggests the reason for this was due to the fact that the economy had declined in the 6th and 7th centuries. He assumes that the coins of Justin II were the only ones in circulation in this period: "of that there can hardly be doubt."[77] It does not seem likely, however, that only Justin II coins were in circulation in the Early Islamic period, but they may have constituted a large number. The Bates and Kovacs hoard indicates that there were different types of Byzantine coins that were in circulation. According to Walsmley, the

[69] Walsmley 1999: 330, 335, 343.
[70] Olavarri Goicoechea 1986: 43.
[71] Olavarri Goicoechea 1986: 43.
[72] Marot 1998: 121, 123, 472-480.
[73] This hoard was discovered in 1983 and is now in the Amman museum. It consists of 1227 pieces. See Noeske 2000: 682-688.
[74] Moorhead 1997: 158.
[75] Spijkerman 1975: 69.
[76] Bates and Kovacs 1996: 165-174; Oddy 2004: 137.
[77] Bellinger 1938a: 20.

fact that the Justin II coins were still in circulation is "a truly frightening revelation for coin-reliant stratigraphic archaeologists."[78]

It is interesting that at the Jerash excavations of Yale and the Department of Antiquities of Jordan excavation in the early 1980s, that, according to the analysis done by Walsmsley in Amman, 3 Jerash mint Arab-Byzantine coins were identified and 45 coins of Scythopolis were identified. This number is very interesting and Walmsley suggests points to the close ties that the two areas had with one another.[79] Unfortunately it is not clear from Walsmley's work which coins came from the Yale excavations and which came from the 1980s excavations. Bellinger himself published a total of 30 imitation Arab-Byzantine coins from the site, but assigned them all to the Beth-Shean mint,[80] as the Jerash mint had not been identified at the time. The Spanish Agora excavations in the 1980s also found Arab-Byzantine coins of this type, apparently all from the Beth Shean mint,[81] but once again, the Jerash mint had not yet been identified. In the more recent Spanish Jerash excavations, five coins from the Jerash mint and four coins from Beth-Shean were found.[82] At Capernaum, one Beth-Shean coin was recorded,[83] while none at all were found at Tel Jezreel. Therefore, the mint of Beth Shean appears to dominate, even at the Jerash excavations, with the exception of the more recent Spanish excavations. Further, in the hoard recorded by Bates and Kovacs, one Arab-Byzantine coin of Beth-Shean was recorded, three of Jerash, three possibly of Jerash, and one uncertain were found.[84] Therefore, once again, the more recent Spanish excavations at Jerash are anomalous to the other Jerash excavations and the other sites. But the picture of this part of the Jerash excavations is corroborated by the Bates and Kovacs hoard. The two mints of Jerash and Beth Shean seem to be closely linked with the Jerash mint subordinate with Scythopolis coins predominating at Jerash at most sites.[85]

But what about excavations at Beth-Shean itself? This is unfortunately not very clear because the excavations have not discovered many coins.[86] The coins from the excavations at the site of Beth-Shean, conducted by the University of Pennsylvania 1921-1933, identified Byzantine and Early Islamic levels. Apart from a gold hoard, only a few excavation coins were identified. Justin II coins are the best represented, there are only four of them, and so the coin numbers are even lower than they were at the much smaller site of Tel Jezreel. No Arab-Byzantine types were reported from site. None of Justin II coins from the Philadelphia excavations were minted Nicomedia, however.

[78] Walsmley 1999: 335. For a similar phenomenon of the continued circulation of Ptolemaic coinage in Roman Egypt see Vorderstrasse, forthcoming.

[79] Walmsley 1992: 258-259.

[80] Bellinger 1938a: 16, 119-122.

[81] Olavarri Goicoechea 1986: 44.

[82] Marot 1998: 136, 139, 493-494.

[83] Wilson 1978: 141.

[84] Bates and Kovacs 1996: 165-174.

[85] Album and Goodwin 2002: 89.

[86] For the site in general see Tsafrir and Foerster 1994: 95-116; Tsafrir and Foerster 1997: 85-146.

Constantinople dominates,[87] as it does at Tel Jezreel and the more recent Spanish excavations at Jerash (see above). Again, however, the numbers were not particularly large. The publication of the recent coins at Beth-Shean from the excavations of 1989-1996 have not revealed any Justin II or Arab-Byzantine coins of the Justin II type, only a coin from Tabariyya. The coin numbers from this excavation have been very disappointing – out of the 370 coins that were recovered, only 48 could be identified.[88] There are two possibilities for why both excavations failed to find many coins. The first is that the soil at the site may lead to severe coin corrosion. Certainly, most of the coins found at the site could not be identified. The other possibility is that the excavators were not digging in the right part of the site, although it is true that the Philadelphia excavations, at least, found the remains of Byzantine buildings at the site.

CONCLUSION

Therefore, when we look at the coinage of Justin II, we can see that there are many sources to better understand the coinage. There is, of course, the numismatics of the coins themselves, as well as the papyrological and historical sources. Dioscorus of Aphrodito's poem which mentions the coinage of Justin II should be seen in the context of a panegyric. It is written by Dioscorus in Greek in order to show off his learning to an audience during the *adventus* of an image of Justin II. This is in contrast to the description of Justin II's coins in John of Ephesus, written in Syriac. John of Ephesus was very hostile to Justin II and his description of his solidi, it is unclear if the audience truly had the negative response to the coins that John of Ephesus claims that they did. In addition, there are a number of imitations of the Justin II: military mints, coins minted in the Persian period, and Arab-Byzantine coins. It is particularly interesting to see that the archaeology points to such a high number of coins of Justin II in the Early Byzantine period in the Decapolis area and that this is replicated by several mints issuing Arab-Byzantine coins that imitate the Justin II types. As the excavations continue to be published, it is hoped we can better understand the coin circulation and it is clear that there is more to do in understanding mint production. It is evident that not all the Jerash excavation results show the same pattern of circulation. The recent Spanish excavations have revealed that the majority of Byzantine coins were from the Constantinople mint and that the Arab-Byzantine coins were minted at Jerash rather than Beth-Shean. It is clear that our understanding of coin circulation in the region means that there still questions that remain to be answered.

[87] Fitzgerald 1931: 51; Bellinger 1938a: 17-18; Fitzgerald 1939: 11.
[88] Amitai-Presis 2006: 607-615.

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Fig. 1. Gold solidus of Justin II, minted in Constantinople (565-578 AD).
Photograph and collection: Geldmuseum, Utrecht, the Netherlands; inventory number 1962-160.

Obverse. Bust facing, wearing cuirass and helmet with plume, diadem, pendilia and trefoil ornament. In r. hand, globe surmounted by Victoria who crowns him with a wreath. On l. shoulder, shield with vestiges of horseman and loop on the top. Inscription: DNI VSTI NVSPPAVI.
Reverse. Constantinople seated looking r. with helmet, tunic, and mantle. On r. shoulder, aegis. With r. hand leans on spear. In l., gl. cr. In ex., CONOB. Inscription: VICTORI AAVCCCE.
DOC 4d. Weight: 4.41 grams, diameter 20 mm.

Fig. 2. Copper follis of Justin II and Sophia, minted in Nicomedia (575/576 AD).
Photograph and collection Geldmuseum, Utrecht, the Netherlands; inventory number 13312.

Obverse. Justin and Sophia facing, enthroned. Inscription: DNIVSTI NVSPPAVC.
Reverse: M. Above, cross to l. ANNO, In ex. NIKO, to right XI.
Beneath, A. DOC. 101b. Weight: 13.56 grams, diameter 30 mm.

Fig. 3. Imitations of Nikomedia folles of Justin II.

a: Syrian mint.

Obverse: Justin (l.) holding a globus cruciger and Sophia (r.) holding a cruciform scepter, seated on a double throne, around dNIVSTI-NVS PP…..
Reverse: "M" with ANNO –Y either side and NIKO in exergue, 11.51g. 10h. This is a very close copy of an official Byzantine follis, but minted in Syria during the Persian occupation of the early seventh century. (Private Collection).

b: Scythopolis.

Obverse: as last, but legends replaced with the mint name CKYθO-ΠOΛHC.
Reverse: as last but year YII, 12.11g., 6h. An Umayyad Imperial Image coin minted at Scythopolis (modern Beth Shean in Israel) several decades after the Arab conquest, probably c. 680. (Private Collection).

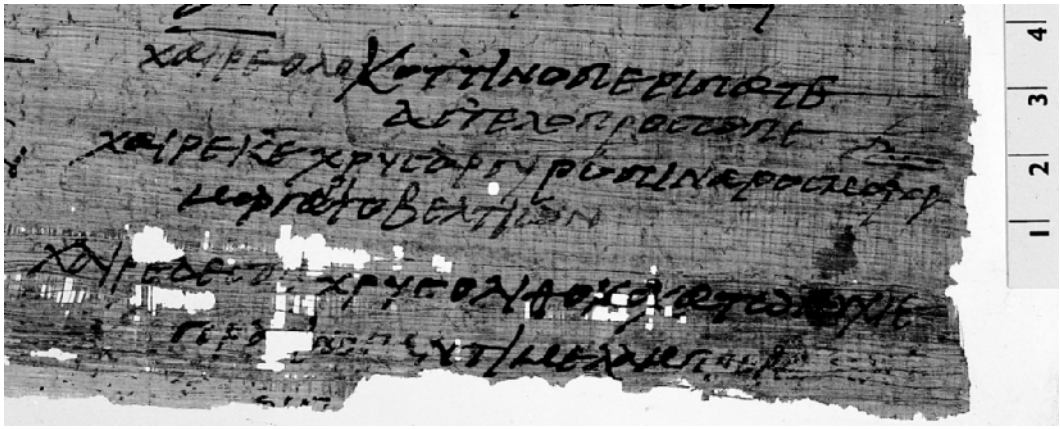

Fig. 4. P. Cair. Masp. 67097 verso, F, 17-29. Source: Centre for the Study of Ancient Documents (Photographic Archive of Papyri in the Cairo Museum website, funded by the Andrew W. Mellon Foundation); the Cairo Museum; the International Photographic Mission of the Association Internationale de Papyrologues and (specifically for the b/w photographs) Adam Bülow-Jacobsen.

ANATOLICA XXXV, 2009

EXCAVATIONS AT ZIYARET TEPE 2007-2008

Timothy Matney, Tina Greenfield, Britt Hartenberger, Azer Keskin, Kemalettin Köroğlu, John MacGinnis, Willis Monroe, Lynn Rainville, Mary Shepperson, Tasha Vorderstrasse, and Dirk Wicke

INTRODUCTION

The eleventh and twelfth seasons of archaeological fieldwork at Ziyaret Tepe took place during July-September 2007 and 2008. Dr. Timothy Matney (University of Akron) served as the project director and Dr. Lynn Rainville (University of Virginia) was the assistant director. Three fieldwork initiatives were undertaken at Ziyaret Tepe during the 2007-2008 seasons. Excavations on the eastern high mound were conducted by Dr. Dirk Wicke (University of Mainz) and concentrated on the excavation of the residential section of the Late Assyrian palace (Operation A/N) first discovered in 2000 (Matney et al. 2002; 2003). On the northern high mound, Prof. Dr. Kemalettin Köroğlu (Marmara University) continued our excavations in Operation L, where a well stratified sequence of remains has been uncovered dating from the early Iron Age through the Medieval periods. Work here in 2007 and 2008 concentrated on the Late Assyrian, Early Iron Age, and Middle Assyrian deposits (levels L4 to L6). In the southwestern lower town, excavations in four areas were overseen by Dr. John MacGinnis (Cambridge University) including work on the city's gate and fortification system, public and domestic structures (Operations G/R, P, and Q).[1]

The two primary goals of the Ziyaret Tepe project during 2007-2008 were: (1) to continue our documentation of the layout and urban planning of the Late Assyrian city of Tušhan and (2) to improve our understanding of the basic stratigraphical sequence from the Iron Age and later periods. This report is organized by excavation area, starting with the high mound excavations and moving then to the lower town. Both areas have a separate section within this report, and include discussion of artifacts of particular interest, as well as brief summaries of on-going ceramic and paleofaunal studies. At the end of this report we present our site-wide ground stone artifact typology implemented by Dr. Britt Hartenberger (Western Michigan University) in 2008. Finally, we present a revised chronology for Ziyaret Tepe/Tušhan.

[1] This season was generously supported by the regional Diyarbakır Museum and its director, Mehmet Akif Bilici, and staff. We would like to acknowledge financial support from a number of institutions: the National Endowment for the Humanities (Grant No. RZ-50721-07), the American Research Institute in Turkey, the Johannes Gutenberg-University of Mainz, the McDonald Institute for Archaeological Research, the Wainwright Fund of Oxford University, the Rausing Trust, the Headley Trust, the Harding Trust, Neil Kreitman, Koç Shipping, the Wassersteins, Lord Browne, the Assyrian Community of Gothenberg, and private donors. Our work, including this report, is only possible because of the efforts and dedication of our field staff, too numerous to name here individually.

Ziyaret Tepe is a 32 hectare mounded settlement on the right bank of the Tigris River in the Diyarbakır Province of southeastern Turkey. It was first systematically recorded during surveys along the Tigris in the late 1980s (Algaze et al. 1991) and the current project was started by Matney in 1997 as part of broader salvage activities undertaken in advance of the construction of the Ilısu Dam across the Tigris River. Our previous archaeological work demonstrates a long, although incomplete, occupational sequence at the site dating from the Early Bronze Age through the Medieval periods, c. 3000 BC to AD 1500 (Matney 1998: 30; Matney et al. 2002: 72; Matney and Rainville 2005; Matney et al. 2007, and see below). Based on surface survey, Ziyaret Tepe reached urban proportions during the Middle and Late Assyrian periods, c. 1300 BC to 610 BC (Matney 1998: 12). At that time the site comprised a high mound or citadel of some three hectares and a surrounding lower town of 29 hectares. During its Assyrian apogee, the city was ringed with a substantial mudbrick defensive fortification wall and moat, the remnants of which are marked today by a low rise amongst the modern agricultural fields which surround the high mound (Fig. 1).

OPERATION A/N (THE "BRONZE PALACE")

The highest part of the acropolis at Ziyaret Tepe was initially excavated as Operation A in 2000-2002 (Matney et al. 2002: 53-58; Matney et al. 2003: 186-187). In these excavations, parts of a monumental Late Assyrian building erected on a massive mudbrick platform were uncovered, showing evidence of at least two different building phases. Six rooms were delineated in association with a large courtyard area during these early excavations (Matney et al. 2002: 53-58). The character of the building, however, remained unclear to the excavators. One of the most intriguing finds in Operation A was the discovery of three rectangular pyrotechnical installations, containing very rich finds, in particular a large quantity of bronzes artifacts, hence our nickname for the building: the "Bronze Palace".

In 2007 and 2008, the principal objective in this operation was to expose more of the Late Assyrian building in order to clarify its layout and architectural development. Moreover, the nature of the pyrotechnical installations recovered in previous seasons needed to be investigated in greater depth. The work of 2007 and 2008 was carried out as Operation N.[2] Operation N comprised excavation in trenches N980E1170, N1000E1170 and N980E1180. Located on the exposed summit of the mound, the cultural deposits show a high degree of erosion, and the Late Assyrian layers have been further damaged by later occupational activities of the Medieval and Ottoman periods. Despite these

[2] Operation N is contiguous to, and in some cases directly continues, the excavations of Operation A. For analytical purposes, these two operations can be treated as a single unit. Recording at Ziyaret Tepe is organized in a locus system. General areas of excavation are given Operation letters (A through Q). Each locus within the operation is given a three digit sequential number (e.g., A-001 to A-999). Excavation is carried out in 10m by 10m trenches which are numbered according to their southwestern corners with a northing and easting in meters referencing an arbitrary datum offsite. N980E1180, for example, has its southwestern corner 980m north and 1180m east of the datum. Individual small finds, or groups of sherds or bones, are given a sequential find number prefixed by the letters "ZT" (e.g., ZT 19106).

problems, important additions to the plan of the Assyrian building were achieved. Particularly fortunate was the discovery of additional undisturbed pyrotechnical installations in the courtyard of the Bronze Palace.

Five different major occupational levels can now be distinguished in Operation A/N. Level N0 is modern and consists of isolated features and pits. Level N1 is Ottoman in date and is represented by a stratum with stone architecture and a layer of pits[3]. Level N2 is Medieval in date and comprises a stratum with mudbrick architecture and a second layer of pits. Level N3 represents an intermediate level with few isolated features. Elsewhere at Ziyaret Tepe, a similarly poorly-preserved level stratigraphically located between the Late Assyrian and Medieval levels has been dated provisionally to the Hellenistic period (Matney et al. 2007: 43-44 "Late Iron Age"; cf. Köroğlu below). Although the evidence still is insufficient, Level N3 might be tentatively ascribed to this date. Level N4 is the Late Assyrian level and in Operation N comprises the palatial building with two distinct building phases.

Level N1

Work in Operation A/N yielded a great number of *tannurs* and pits as well as the rather flimsy remains of stone walls, resembling broadly the results in Operation L (Matney et al. 2007: 25-43). Remains of the upper layer (Phase N1) comprise thin walls of unworked stones, mostly medium-sized pebbles, in single or double-rows. In the following report areas delineated by these stone walls are designated as rooms, which should not be taken literally. The observed arrangement of walls could just as easily represent open activity areas.

In general, no coherent structure for the overall area can be recognised for the later occupation. The walls form single room-like units such as Room 1 in N980E1170 or Room 2 in N1000E1170. Some door-sockets were found still *in situ* even when the wall to which they were associated had already vanished, e.g., Room 4 in N980E1180.

One of the better preserved contexts is Room 1 and its connected features (Fig. 2a). Room 1 consists of two connected stone-walls N-162 and N-165, which are preserved to a height of two courses. Sandy bricks and remains of concrete-like, coarse mortar with pebbles remind one of Roman or Byzantine building-techniques that were continued into Islamic times although these techniques are rarely found in domestic architecture at Ziyaret Tepe. The room was entered from the SW, where it seems to be connected to a large rubbish pit. An oval pottery tray was placed upon a single brick at the outside of wall N-162. To the east a scatter of stones and a stone pavement belong to the same level. An oversized stone mortar was found adjacent to this pavement. A constructed storage pit (N-216) turned out to be rather conspicuous: a circular row of large stones was laid out at the bottom as a foundation. The lining consists of thin bricks with insets of three stones in

[3] The designations and final dating of the Levels N1 and N2 are preliminary only, awaiting a full consideration of the pottery by Vorderstrasse (cf. below). The levels are for now termed Ottoman and Medieval, but may require reassignment thereafter. In general, they describe differences observed in terms of architecture and stratigraphy. Early and late phases were assigned for Levels N2 and N4.

a horizontal row at irregular intervals. Organic remains from the bottom of Pit N-216 suggest it was originally used for grain storage. After the storage pit fell out of use, it was used as a dump, containing large amounts of bone and pottery in its upper layers (see below).

Room 2 is associated with a large *tannur* which was rebuilt several times as indicated by different linings and traces of remodelling of the cupola; the stoke-hole is orientated north. Further *tannurs* were found close by, attesting to the domestic use of this area over a long period of time. A similar outline of a room and a *tannur* was detected in Room 3 in N1000E1180. Here, two stone walls are associated with a floor and *tannur* and appear to form a domestic unit. All that remains of Room 4 is the door socket construction. The associated walls have been eroded away. The walls to Room 5, built of double rows of stone, are thicker and seem to be stronger although this room's connection to other installations in Level N1 is uncertain.

In general, the remains of Level N1 give the impression of dispersed domestic occupation in this part of the acropolis, similar to the results in Operation L where these alignments of stones were associated with the erection of tents (Köroğlu 2007: Fig. 3). With the discovery of mortar fragments and door sockets in Operation A/N, such an interpretation becomes less likely, pointing rather to poorly constructed, although permanent occupation in Level N1.

Level N2

Directly underneath the remains of Level N1, mudbrick walls were found and attributed to Level N2. These walls were largely destroyed by natural erosion and the habitation activities of the occupants of Level N1. In contrast to the wall foundations and lower courses of Level N1, which were built of stone, the walls of Level N2 are made of mudbricks or pisé. Again, due to patchy preservation it was not possible to reconstruct a coherent plan of rooms or buildings. Significant, however, is an overall orientation of walls along a north-south axis across Operation A/N. The narrow alignment of walls N-009 and N-010 (Fig. 2b) and the corner of a room formed by A-131 and A-132 (not shown), resemble Level L2 in Operation L (Matney et al. 2007: Fig. 5). Unusual are two clay features, roundish "postaments" in association with mudbrick walls, which might have served as working installations.

More than thirty pits were assigned to Level N2 in the 2008 season alone. The proximity to the surface and later disturbances, however, made it difficult to discern a stratigraphical order to the pits. Nevertheless, two different stratigraphic horizons within Level N2 indicate an earlier and a later phase of occupation. The latter of these two horizons produced a particular type of glazed pottery, which contributes to the overall pottery sequence at Ziyaret Tepe.

Level N2 Medieval Ceramics from the High Mound

The excavations in Level N2 revealed pottery that was similar in form and ware to what had already been discovered in Operation L (Matney et al. 2007), strongly

suggesting that the two areas had been inhabited simultaneously. Our continuing analysis of these wares dates the Medieval occupation at Ziyaret Tepe from the late 13th to the early 15th century, with the bulk of the material dating to the 14th century AD. A number of new types of pottery wares were found in the course of the excavations in Operation N in 2007-2008. None of these new pottery types were particularly common, which could explain their absence in Operation L, excavated over an area of only 400m^2. The first new type is a white slipped pottery with a clear blue glaze and black and cobalt underpainted decoration. This pottery is probably related to 13th-14th century Sultanabad wares produced in Iran and copied in Syria and Egypt (Watson 2004: 373-405; Millwright 2008). The second type is an unusual type of luster ware. Unlike many luster wares, the Ziyaret Tepe examples do not have typical metallic copper luster painted in patterns onto a white ground. Rather, the luster is applied to the ground upon which is painted a design in blue-green decoration. The third new type is a white glazed, thin-walled pottery with similarities to other wares in terms of forms represented, but these examples are much thinner.

Level N3

The evidence for an intermediate Level N3 post-dating the Late Assyrian and pre-dating the Medieval occupation is scant. Level N3 is attested in some pits and one *tannur,* and from a few painted pottery sherds which can possibly be ascribed to the Hellenistic period. Here, again the results parallel those from Operation L in previous seasons. On the other hand, the overall arrangement of parallel mudbrick walls somewhat resembles plans such as the area south of Ezida at Nimrud attributed to the Hellenistic period (Oates and Oates 2001: Fig. 165).

Level N4: The Late Assyrian "Bronze Palace"

As noted above, the dominant remains on the citadel date to the Late Assyrian urban occupation of Ziyaret Tepe (see Matney et al. 2002: 53-58; Matney et al. 2003: 186; Matney and Rainville 2005: 44). The recent excavations in Operation N confirmed earlier results from the 2000-2002 seasons by documenting two distinct late Assyrian building phases, which are clearly separated by a localized destruction layer and a slight remodelling of the building plan. The building itself is erected on a mudbrick platform constructed in order to create a level building surface. The platform varies in thickness with a maximum depth of nearly two meters, as was established in sections excavated along the edge of the citadel and in several pits across the area (Matney et al. 2003: 186-187). A preliminary assessment of the dates for comparanda of the small finds from Operation A/N suggests that there was only a short interval between the destruction layer and later renovation of the building, which is in accord with stratigraphic observations.

The plan of the Late Assyrian building recovered so far is arranged around a large Courtyard 5 covering at least 330m², the eastern edge of which has eroded off the high mound (Fig. 3). The principal walls for both phases of the Bronze Palace are directly cut into the mudbrick platform, the top of the platform itself being used as an initial floor or,

in places, as the foundation for the baked brick paving. In the upper Late Assyrian phase, the courtyard is paved with baked bricks laid out on a pebble substrate. Two major walls limit Courtyard 5 to the west and north. They are made out of distinctive red bricks set in grey mortar with walls four to five bricks in width. These walls were used in both Late Assyrian phases. The earlier phase walls were partially reused as foundations for the thinner walls of the later phase. In places, the walls are slightly offset so that the later walls abut the earlier ones lengthwise. The use of lengthwise abutting walls marks the renovation of the building shortly after its first destruction in a localized conflagration. In contrast, later added secondary walls are cut into the mudbrick collapse of the lower phase rooms and do not reach into the platform itself.

In terms of the plan, a major reception room (Room 7) was entered from Courtyard 5 by means of two steps and through a monumental entrance in grid square N990E1170. Remains of a three-stepped cover stone for the doorsocket (N-122) were discovered *in situ* along the inner face of wall N-143. The cover stone capped the actual socket chamber, which was constructed out of three layers of baked bricks with a monumental pivot stone coated in bitumen at the bottom (Fig. 4). Both the baked bricks and pivot stone were clearly re-used from earlier constructions. Upon further clearing of wall N-143, two areas of painted plaster were found lying horizontally within the rubble, apparently having fallen off the wall. The remains of one large plaster fragment shows a lotus flower-and-bud chain framed by rows of zigzag-ornaments. A second plaster fragment depicts rows of rosettes and circles, but figurative parts of the composition could not be retrieved. The ornaments are outlined in black and executed in bright colours of dark blue, light blue, and red against a white background (Fig. 5). An analysis of the pigments established the use of iron oxides for the reddish areas, and artificially created cuprorivaite (calcium-copper tetrasilicate or "Egyptian Blue") for the blue. The white plaster background consists basically of gypsum but also contains a considerable amount of kaolin, which may occur naturally in the vicinity of Ziyaret Tepe.[4]

Dating of the upper Late Assyrian level can be approached, in part, stylistically through the painted plaster motifs. The zigzag ornament in particular is a good chronological indicator. It finds its best parallels in Nimrud, where it appears for the first time in the Central Palace or so-called "Upper Chambers" attributed to Adad-nerari III whose reign is typically dated 810 – 783 BC (Nunn 1988: 125, Pl. 96, 97; cf. Oates and Oates 2001: 70; Albenda 2005: 19, Pl. 5-7). More recent finds with a very similar zigzag pattern were discovered at Tell Masaikh, the ancient Kar-Assurnasirpal, dated to a phase ascribed to building activities of Nergal-ereš, Assyrian governor at the time of Adad-nerari III in the early 8th century BC (Poli in Masetti-Rouault 2003: 581, Fig. 18; cf. Poli 2008: 538f. Fig. 10). Comparable rows of rosettes linked by parallel stripes like N-266 were discovered in rooms of the "Governor's Palace" at Nimrud. The building is ascribed to the time of Adad-nerari III, again dating to the early 8th century BC, although Mallowan comments that some paintings might have been redone in the mid-8th century

[4] The pigment samples were studied by IR-spectroscopy at the Institute for Mineralogy, University of Mainz. Our special thanks go to Prof. Dr. M. Hofmeister for his help on this matter.

BC (Mallowan 1950: 182, Pl. XXX:1-3). In any case, the wall-paintings at Ziyaret Tepe are unlikely to ante-date 800 BC. Another feature linking the Ziyaret Tepe building to Nimrud is the stepped lintel stone N-122 which finds parallels at Nimrud. Several similar examples were found stacked in the gate room SE 13 at Nimrud, probably for later reuse (Mallowan 1966: 420, Fig. 347; Oates and Oates 2001: Figs. 97, 101). Comparable cover-stones were discovered in various monumental Assyrian buildings, such as Nineveh and Assur, all indicating a date in the 9th or 8th centuries BC.[5]

The earlier Late Assyrian building (Fig. 6) shows a similar spatial arrangement. Here preservation is better due to intense burning and protection by thick mudbrick collapse layers. In general, the walls are thicker – up to five bricks wide – but no plaster decorations were discovered related to this earlier building. Rooms adjacent to the courtyard can be defined much better in the earlier building. Rooms 7a, 6, and 2 are all equipped with well built baked brick floors, set into a layer of fine sand. Entry into Room 2 was from the north over a limestone sill, showing traces of the central door stop. Room 6 seems to have functioned as a passage from the courtyard to the inner rooms. The plan of the room was largely destroyed by a pit, which obscured any signs of doors.

In the earlier Assyrian plan, the major reception Room 7 was of a smaller design, being divided into two rooms, here preliminary called 7a and 7b. Room 7a is a small room with a baked brick pavement. The flooring bricks are laid in bitumen and bitumen was also found along the bottom edge of the walls. An entrance might be reconstructed from Room 6, where irregularly laid bricks seem to suggest that arrangement. A connection to Room 7b is less likely. Room 7b is the major reception room of that suite. It could be entered from the courtyard through a small door in the middle of the long wall. The entrance is marked by a door-socket with stepped decoration, N-278, which is similar to N-122 but smaller. Two tram lines indicate the existence and location of a movable hearth, frequent in reception rooms of elite Assyrian buildings. Since tram lines are generally located further to one end of representative long rooms, this suggests that Room 7b will extend further to the south where excavations are still on-going. The floor to Room 7b was not paved but made of compacted beaten earth, showing traces of heavy burning.

Important finds on the floor of Room 7b include a Late Assyrian glazed vessel (N264, ZT 29777) with rolled rim and a decoration of blue, white and reddish petals. This vessels finds very good parallels in Nimrud, e.g., from royal tomb IV (Hussein and Suleiman 2000: Fig. 213; Oates and Oates 2001: Fig. 153), as well as in Late Assyrian contexts of Assur (Andrae 1923: Pls. 17a, 20; Curtis and Reade 1995: no. 142), Tell Sheikh Hammad (Kühne 1984: Fig. 67:16), Khirbet Khatuniyeh (Curtis and Green 1997: Fig. 38, No. 161) and in the 8th century BC layer of Tell Masaikh (Masetti-Rouault 2005: 680). However, precise dates cannot be claimed for the vessel, although the ceramics generally are paralleled most closely in the 8th century BC.

[5] Cf. a collection of examples albeit not up to date in Damerji 1987: 155-158. Further examples have been unearthed in several more recent excavations such as Khirbet Khatuniyeh (Curtis and Green 1997: No. 112). A comprehensive study of Assyrian cover-stones is being prepared for the final publications.

A fragment of a cuneiform tablet (N-260, ZT 29795), discovered on the last day of excavation, represent the first evidence for cuneiform writing on the acropolis.

In grid square N1000E1170, findings from the earlier Late Assyrian level are less clear. The large number of pits has destroyed the central part of the area, but it seems likely that most of the trench once formed a single large Room 9. Several pits cut deeply through the mudbrick platform and into earlier occupation deposits. Occasional handmade pottery sherds from these pits suggest that the deposits immediately below the platform may represent local Early Iron Age or Middle Assyrian occupation levels. In future seasons, we hope to expose more of these layers in order to complement the stratigraphic sequence, established by means of the step trench in Operation E (Roaf in Matney et al. 2002: 62-68).

Another extraordinary small find is a basalt object (N-260, ZT 29749), which might be considered as a distorted version of a duck weight, weighing only slightly more than one kilogram. ZT 29749 was found on the floor of Room 7b of the lower Assyrian building phase. Roughly rectangular in shape it shows a Y-shaped incision on one tapering end. The bottom of the object is flat and smooth; the upper side is decorated with a protruding element that rather resembles a flower-bud, such as a closed lotus-blossom, and only faintly recalls the head of a bird turned back in the usual manner of Mesopotamian duck weights. However, it can be compared to contemporary objects from Tell Shiukh Fawqani (Makinson 2005: 548, pl. 37, No. 251 ascribed to level IX (= 7th century BC) or Zincirli (Andrae 1943: 27f., Fig. 17, Pl. 11f, g) of a wide early first millennium BC date range, both of which show similar distortions from the Mesopotamian antecedent. The use of basalt, found widely in the Diyarbakır region argues in favor of local manufacture.

Late Assyrian pyrotechnical installations

The most enigmatic features excavated in Operation A during the 2000 and 2001 seasons were three pyrotechnical installations (A-242, A-252, and A-805) which were filled with a rich inventory of small finds. These were initially described as kilns used in metal-working (Matney et al. 2002: 55-56), but their interpretation now seems more complex, as discussed below. The three installations had been discovered in Courtyard 5 of the Bronze Palace and two of them (A-242 and A-252) were sealed by the brick pavement, while the third, stratigraphically later, (A-805) was cut into the pavement. Radiocarbon dates taken from A-252 have been recently reanalyzed and suggest a date for the stratigraphically earliest of the installations in the second half of the 8th or early 7th century BC.[6]

[6] Three tightly-clustered radiocarbon dates were taken from A-252 and reported as AA-60278, AA-60279 and AA-60280 (Matney et al. 2005: 44). Recently these dates were statistically combined using OxCal 4.0 and then constrained to the time frame beginning with Ashurnasirpal's resettling of Tušhan in 882 BC and ending with the last possible date for the cuneiform tablets found in Operation G, namely 610 BC. This provided a 2-sigma calibrated date of 754-613 BC, with the greater probability (58.7%) that the date is early, between 754 and 684 BC. See also, Matney et al. 2002, 55f., Figs. 5-10 for pottery; and for further pottery analyses cf. McDonald in Matney and Rainville 2005: 44-46

In 2007, a fourth pyrotechnical installation (N-070) was found in line with the other three, slightly further south and undisturbed by later pits (Fig. 7). The nearly rectangular installation N-070 measures roughly 2.70 x 1.40 m. The installation is dug into the courtyard pavement and paving bricks had been removed to facilitate the cut. Thus, N-070 belongs to the later phase of installations along with A-805. After burning, the pit of N-070 seems to have been backfilled without repaving the patch since bricks were not found covering the feature. Two different layers of infill were discernible in N-070: a thick layer – 15cm to 20cm – of yellowish-greenish ash on the bottom, mixed with bones, including human bones, and above that a roughly 30cm thick deposit of fairly hard, dark soil along with most of the pottery from that locus and some very brittle bronzes. Objects such as a ceramic flask (N-070, ZT 25250) appear unburnt and may have been deposited after burning, perhaps on the occasion of the closing of the pit. The very soft lower ash layer contained a large variety of heavily scorched luxury goods, such as stone vessels, beads and seals, carved ivories and ivory tubes, a glass vessel and a large number of bronze items such as vessels, rings, and sheet metal rosettes with engraved decoration.

In 2008, a narrow slot-trench was laid out in N980E1180 in order to cut through the four known installations and document their sequence and stratigraphical relationship (see Fig. 6 for the location of the slot-trench). Adjacent to A-805, we found a complete bronze vessel with horizontal rim on a conical stand (N-212, ZT 29212). The vessel contained burnt human bone as well as engraved ivory. Its location outside of A-805 suggests that these finds were perhaps removed and abandoned during a later disturbance of A-805.

While excavating the slot-trench, a fifth installation (N-212) was unexpectedly found. Installation N-212 was located between A-805 and N-070. Cut into the mudbrick platform deeper than both A-805 and N-070, installation N-212 was apparently discovered in antiquity during the construction of later N-070, but was subsequently carefully re-sealed with bricks and appears otherwise undisturbed. Measuring 2.25m by 0.80m, it is the smallest of the five installations, but clearly recognizable by its distinct burnt orange clay lining and the thick deposit of greenish ash on its bottom.[7] N-212 is rectangular in outline and has a small protrusion at the eastern end, resembling the shape of A-242 and A-252. Finds from N-212 proved to be fewer in number than the ones from N-070, but as rich in quality. Noticeable are finds of ivories engraved with figurative and geometric designs. Other finds are briefly discussed below.

In the ashy material of both N-070 and N-212 a large quantity of very badly burnt human bone was discovered. Greenfield was able to single out some infant finger bones and milk teeth, documenting the presence of several individuals. The human bones await further anthropological analysis. Traces of heavy burning on the objects found inside the pits attest to temperatures between 1100-1200°C reached during firing. Most indicative of the high temperatures is the warping of the bones, the discolouration of the ivories, and

[7] Possibly faint traces of an orange burnt border to a similar installation was discovered beneath A-252 in section only. This may represent an installation which was also cut and cleared off on occasion of the construction of A-252 and would thus represent a sixth and earliest pyrotechnical installation.

the burst stone vessels. Scorching on the surrounding bricks indicates that the burning took place on the spot.

In total, installations N-070 and N-212 yielded well over 300 small finds during the 2007 and 2008 seasons, of which only very few distinctive items are presented here in preliminary form as they are immediately relevant to the chronological assessment of the deposits. Stylistically, the finds date the pyrotechnical installations to the 8th or 7th centuries BC, which had also been suggested by the radiocarbon dates for A-252. The carved ivories are particularly important for dating. Figurative ivories with rows of courtiers (N-249, ZT 29636) resemble the Assyrian style of the late 8th century BC (Fig. 8a). Most obvious is the arrangement of hair as a close bunch at the neck, typical of Sargonid art. An ivory dish with a handle in shape of a hawk's head (N-249, ZT 29615) is a unique example of Assyrian ivory-carving (Fig. 8b). It finds its closest parallels in a stone bowl with figurative handle from royal tomb I at Assur (Haller 1954: 173, Pl. 41a-c) and in a stone saucer with figurative handle from Nineveh, which resembles the general shape of the dish as well (Searight et al. 2008: No. 518, Fig. 49:518). Likewise, stone bowls with double rims (not shown) are generally dated into the 8th to 7th centuries BC. Gypsum vessels such as two ovoid alabastra (not shown), which were found unburnt above the burials, also support this chronological ascription. The stone vessels are discussed in the specialist's report below.

Several bronze rosettes with engraved decoration were discovered (not shown), which have almost exact parallels in the Assyrian heartland, e.g. in a find from Assur, dated to the last decades of the Assyrian empire (Ass 21569a from house i6:2: Miglus 1996: 177, Pl. 16d). A tripartite bronze fibula (N-249, ZT 29610) (Fig. 8c) has a chronological range of the 7th to 6th centuries BC (Typological group D3: Pedde 2000: 299-301, with further references). In general, the royal tombs from Nimrud provide a large number of good comparanda to the numerous bronze vessels from Ziyaret Tepe, e.g., tall and narrow beakers, bowls with vertical rims, carinated bronze vessels, and bowls with swinging handles (cf. Hussein and Suleiman 2000).

Four stamp seals were found in Operation N also generally of 8th to 7th century date. ZT 25244 (N-056) is a scaraboid and shows a female worshipper standing in front of a presumably female seated deity with flat-topped, three-horned crown on a throne with high back-rest adorned with little spheres at the back (Fig. 8d). The worshipper wears a round cap and robe with vertically tasselled fringe. The iconography of the seated goddess is not precise enough to allow for an identification to be made; the illustration resembles depictions of Gula [8] or Ninlil/Mulissu [9] on similar thrones. [10] Several comparisons can be made with other Assyrian stamp and cylinder seals[11]. Two close examples, are linked to the reign of Adad-nerari III: a seal in the Ashmolean Collection

[8] On cylinder-seals: Collon 2001: 122 Nos. 232-238, identified due to the combination with a dog.

[9] As on the rock-reliefs from Maltai: Börker-Klähn 1982: 210f. No. 207-210, due to her association with Assur.

[10] Cf. discussion by Herbordt 1992: 75-77, who stresses that this image prevails in the 8th-7th century BC.

[11] Cf. Herbordt 1992, in particular Nos. Nin 32, Nin 95, Nrd 138, Nrd 117, Sonstige 3; from Nimrud, Tomb III, assigned to the late 9th century, IM 115644: Hussein and Suleiman 2000: Fig. 183; Jakob-Rost 1997: Nos. 219-222.

with the inscription of Nabû-ša-uṣur, a high official of Adad-nerari III and a sealing from the 8th century BC phase of Tell Masaikh (Buchanan 1966: 114, No. 633 Ashmolean 1922.61; Poli in Masetti-Rouault 2005: 682, Fig. 16). The latter example comes from phase NA2 at Tell Masaikh and is considered to represent the work of Nergal-ereš, local governor under Adad-nerari III in the early 8th century BC.

The cone-shaped seal ZT 25349 (N-070) depicts a worshipper in front of a table beneath a crescent (Fig. 8f). The worshipper wears a long belted garment and has his arm raised. Only half of the seal is preserved, but there is enough space for a deity behind, opposite the table (cf. Herbordt 1992: Pl. 2:1-5; compare as No. Ninive 135 with two adorants). It is of the Assyrian modelled style, although not many details are visible. ZT 25505 (N-070) possesses a very simple plant motif resembling a tree with ten branches growing off the vertical stem (Fig. 8e). An impression of a very similar stamp seal was discovered in Gezer, dating to 651 BC (cf. Herbordt 1992: 168 No. Gezer 2, with reference to another example from Tell Halaf); further comparisons are attested from Babylon (Jakob-Rost 1997: Nos. 456, 457). An interesting parallel is provided by the decorative use of a similar design on an 8th century BC Assyrian jar from Tell Masaikh, which attests to the widespread use of seals (MK08 2202: Masetti-Rouault 2004: 552, Fig. 20). A simple but carefully rendered design of crescent and eight-pointed star between two simple crosses is attested on seal ZT 29612 (N-249) (Fig. 8g). The rendering of the star with a central dot can be compared to a seal from Assur found in Late Assyrian tomb No. 867 (Jakob-Rost 1997: Nos. 400, 404).

A Late Assyrian Bronze Hoard: N-234

In the process of excavating N-212, parts of the surrounding pavement were removed. Sealed beneath a single brick of the pavement was a hoard of more than twenty bronze objects (N-234), including a number of luxury vessels. The bronze vessels were crammed into a small space hollowed out under the brick, accordingly bent and distorted; the covering baked brick itself was scooped out at the bottom to accommodate the objects better. Initially, a carinated vessel on a stand and some small cups, a bell, some cylindrical objects with embossed decoration, and further small items were placed in the pit. On top of that were found: a large vessel with vertical rim and swinging handles, a juglet with a Cypriot style palmette handle similar to ZT 7279 (A-252, cf. Schmidt and Reimann in Matney and Rainville 2005: 46f., Fig. 17), three additional bowls with central omphalos, and more cylindrical elements with embossed decoration. These artifacts resemble types from the royal tombs at Nimrud (Hussein and Suleiman 2000), but they require further treatment before they can be discussed in detail.

Interpretation

In sum, the Bronze Palace from Ziyaret Tepe closely resembles the plans of Assyrian buildings such as the Governor's Palace and the Burnt Palace in Nimrud, or palaces in Late Assyrian provincial centres such as Arslan Tash, Zincirli, Til Barsip, and Tell Masaikh. From historical documentation, we know that Ashurnasirpal II lists as one

of his accomplishments the foundation of a "royal palace" at Tušhan in the year 882 BC, providing a *terminus post quem* for construction on the citadel (Roaf in Matney et al. 2002: 49-51). Tempting as it is to posit that the Bronze Palace is the palace of Ashurnasirpal, there is nothing specifically to link our early phase in the Bronze Palace to this date. The observation that the wall paintings of the Bronze Palace are stylistically similar to those of the early 8th century BC could argue that the Bronze Palace was in use at least by that time and that the examples found in the late phase palace represent an archaizing tradition. Likewise, there is nothing which dates the end of the Bronze Palace to the latest Assyrian occupation of the site, established via cuneiform tablets at 611/610 BC (Matney et al. 2003: 189-191), although the presence of multiple phases of architecture suggest a long use-life. In terms of the pyrotechnical installations, the radiocarbon dates and the small finds associated with them argue for a date in the late 8th century or early 7th century BC, as noted above. As the installations were not part of the original building plan, the Bronze Palace must have been constructed before this time. Tentatively, then, we might suggest that the Bronze Palace was built in the late 9th-early 8th century BC and fell out of use sometime in the early-mid 7th century BC, bearing in mind that earlier palaces in the same spot may have been entirely removed during renovation.

Until now we have not commented on the function of these pyrotechnical installations. When we first uncovered A-242 and A-252, we believed them to be metal-working kilns based on the presence of considerable quantities of greenish slag (Matney et al. 2002: 55-56; Matney et al. 2003: 186; Matney and Rainville 2005: 44-47) and the intensity of burning seen in the installations themselves. Furthermore, preliminary results of the analysis of the slag from the two stratigraphically earlier kilns recovered in 2000-2002 seemed to support this conclusion.

Subsequent excavation of more installations and the continuing analysis of the older materials now suggest that this interpretation is, at best, only partially correct. As noted above, both N-070 and N-212 contained quantities of burned human bone. Its identification was exceedingly difficult because of the intensity of fires which consumed the bulk of the bone material, leaving only an ashy residue which had become subsequently stained green from the bronzes. The evidence for seeing these pyrotechnical installations as cremation burials is now quite strong.

Pit cremation burials ("Brandgrubengräber")are rarely attested in Late Assyrian contexts. The closest parallel to the installations in Operation A/N can be found at the site of Tell Sheikh Hamad, in excavation area "Unterstadt II" where fifteen pit cremation burials found there were compared by Kreppner to Roman "bustum" type of burials (cf. Kreppner 2008). Likewise, cremation burials of a different type from the Late Assyrian period have been reported from the village site of Kavuşan Tepe nearby to Ziyaret Tepe (Kozbe, pers. comm.).

Two caveats must be borne in mind regarding this interpretation. First, there is no *a priori* reason to think that these installations must exclusively represent *either* cremation burials or metal-working installations; they could have been both. In other words, these installations might have been used for producing copper or bronze for some

time before their final usage as a cremation pit for human bodies. Second, there is a morphological difference between the installations which must be explained. As noted earlier, one group of installations have semi-circular plastered depressions on the short ends, as very clearly seen in A-242 and A-252 (Matney et al. 2002: Fig. 8). The second group does not have these semi-circular areas, but are rather simple deep rectangular pits lined with mud-plaster. One possible explanation is that these depressions represent where tuyères were inserted in the installations which functioned as simple bowl furnaces for producing copper and bronze (Hodges 1981: 68). Alternatively, these depressions could have been used for ventilation during cremation. At the end of their use-life A-242, A-252 and N-212 were then used as cremation furnaces. The disappearance of the semi-circular depressions in the later installations, then, might signify that the original function of these installations for metalworking in the earlier phase of the Bronze Palace had been abandoned and that later installations were simply intended as cremation pits.

In any case, the wide range of artifacts and materials found in these installations emphasizes the importance of the individuals cremated in the living quarters of the Bronze Palace. The practice of cremation burials is attested in the Middle Assyrian period and considered to be derived from Syrian inspiration, although as noted earlier it is not a common Assyrian custom (cf. Kreppner 2008, with further references). In contrast, the type and style of objects suggest a close connection with the Assyrian capitals and the placement of the burials adjacent to the reception room in the courtyard of the palace links them to the Assyrian rulers. This combination of local and foreign elements needs to be interpreted as a phenomenon of cultural contact.

ZOOARCHAEOLOGICAL REMAINS FROM OPERATION A/N

Intensive sampling of animal bones from Operation A/N was undertaken during both the 2000-2002 and the 2007-2008 campaigns. This preliminary report focuses on the Late Assyrian and Medieval levels in this area, as these are the periods with the highest frequencies of zooarchaeological remains. The general strategy for collecting animal bones has been to sieve primary contexts (e.g., deposits on or just above the floors and within features) and to hand collect the secondary contexts (e.g., fills, building collapse) across the area of excavation. While this strategy allows excavations to proceed at a reasonably rapid pace, necessary for broad-scale excavation, it does create a bias towards medium and large mammal representation. Micro-faunal remains collected via microdebris sampling are not included here. All frequencies represent NISP.

The faunal sample size from Operation A/N is large (n=18460) and allows us to make a robust assessment of the animal usage across the periods represented in this area. By far the largest number of specimens comes from Medieval (n=7527; 41% of the total assemblage from Operation A/N) and Late Assyrian (n=4486; 24%) contexts, while the remainder of the animal bones come from modern, uncertain, or intermediate deposits. The Ziyaret Tepe assemblage is extremely well preserved; almost all bones (>99%) are lightly weathered, regardless of period. Similarly, the bone element analysis provided below suggests that even fragile elements are well preserved. A higher frequency of

bones were burned in the Assyrian period (n=264; 5.9% of the Assyrian assemblage) than in the Medieval period (n=126; 1.7% of the Medieval assemblage) perhaps reflecting different functional uses in the area over time.

Late Assyrian faunal assemblage

Domestic species dominate the Late Assyrian assemblage, representing 97.5% of bones that were identifiable by taxon (n=930). Wild species are few in number (n=24) and represent a small percentage of the bones identifiable by taxon (2.5%). Fish and wild birds are nearly absent from this period. As seen in the chart showing age distribution by taxon, based on NISP and using only those elements that provided age indicators, the three principal domestic species, *Bos*, *Capra,* and *Ovis,* have similar patterns of exploitation with an emphasis upon subadults, followed by adults (Fig. 9). *Sus scrofa dom.* patterns are different in that juveniles are more numerous than adults. Older individuals are preferred in the other species, both domestic (*Equus*) and wild (all cervids, *Bos, Sus*) although the sample size for these groups is very small. An analysis of element representation for the Late Assyrian assemblage suggests that there is no clear preference for specific choice cuts of meats among domesticates, particularly among *Bos, Ovis, Capra* and *Sus*. This sample is associated with the Bronze Palace, where it was expected that there would have been selection for choice cuts of meat for the elite in the palace, but this does not appear to be the case. Overall, only a small percentage of bones are butchered (n=66, 0.9%). Again, since this was the location of the palace, we anticipated a larger percentage of butchered bones from food preparation would be found. Given the balanced representation of all sections of the body (distal and proximal limb; thorax; crania), butchering appears to be occurring in and around the palace. The paucity of butchering marks might imply careful use of meat and efficient use of butchering technology by specialized butchers. Most of the butchered bones are from domestic animals and only two are from a wild species (*Cervus elaphus*). Of particular interest was the recovery of bones from *Gallus gallus*, domesticated chicken, in good Late Assyrian contexts in Operation A/N.

Most of the animal bones from Late Assyrian contexts with evidence of use wear polish are fragmentary and not assignable to a species or to a clear tool/ornament category (n=111). Those bone tools that could be identified (n=7) are entirely comprised of *Ovis/Capra* bones. Astragali rubbers are the most common type found (n=4). The absence of bones related to tool production implies that this activity took place elsewhere at Late Assyrian Tušhan. Bearing in mind that we have only worked in a restricted area of the palace, kitchen facilities might have been located elsewhere in the unexcavated portion of the building.

Medieval period faunal assemblage

In the Medieval period, domestic species again dominate with 97.4% of the total assemblage (n=1798). Significantly, domestic camels appear in this period. Amongst the wild animals (n=49; 2.6%), deer dominate the collection. Fish are again absent. Most

domestic species, including *Bos*, *Capra, Equus, Ovis, and Sus* appear to have similar patterns of exploitation in the Medieval period as they did in the Late Assyrian period. The pattern differs significantly with wild species. There are several wild patterns of exploitation strategies; among Capreolus and Sus, there is no preference for particular age groups; among Bos, there is a clear preference for adults; and Canis and Cervus demonstrate a preference for subadults, followed by adults. Of the entire wild assemblage for this period, only Sus and Capreolus had a younger age class present (juvenile).

As in the Late Assyrian period, based on bone element representation, there does not appear to be a preference between limbs of animals for any of the species. This reflects a full utilization of all parts of the animal, which further indicates that butchering and food preparation probably occurred in the area. It also indicates no clear preference for specific limbs or cuts of meat.

The Medieval period has a higher frequency of butchered bones (n=118) than the Late Assyrian period; most are from domestic animals (93.5%). The most frequent taxon represented in the butchered assemblage was *Bos taurus* (n=27) followed by *Ovis/Capra* (n=20), *Ovis aries* (n=10), *Sus scrofa* (n=10), *Capra hircus* (n=11) and Equids (n=9). Five examples are from wild species. Non-diagnostic polished bones are common (n=111), while other tools such as rubbers, scrapers, and awls are represented by only four specimens. *Capra hircus* is the only taxon represented in the Medieval bone tools.

Broadly, the frequencies of taxa represented in the zooarchaeological collection from Ziyaret Tepe are similar for both the Late Assyrian and Medieval periods. Both have high frequencies of *Ovis/Capra*, *Bos taurus* and *Sus scrofa*, although the patterns of exploitation by age require further analysis. During the Medieval period in Operation A/N, there is an increase in the variety of species represented, perhaps suggesting more diversified exploitation patterns. Bone element representation indicates utilization of all animal parts for both periods and the lack of contrast between the Late Assyrian Bronze Palace and the Medieval domestic contexts is surprising. The lack of a specialized meat economy and butchered bones from the Assyrian Bronze Palace begs for further investigation.

EXCAVATIONS IN OPERATION L (2007-2008)

Excavation in Operation L at the northern edge of the high mound at Ziyaret Tepe started in a single 10m by 10m trench (N1080 E1030) in 2004. This area was expanded in 2006 when three additional trenches (N1070E1030, N1090E1030, and N1080E1040) were opened up (Szuchman and Kayser in Matney and Rainville 2005: 35-37, Matney et al. 2007: 24-47). Much of these first two seasons was devoted to recovery of remains dating to the Ottoman (Level L1) and Medieval (Level L2) periods and the results published in our preceding report in this series. Brief notes on the remains of two earlier periods dating to the Late Iron Age/Hellenistic period (Level L3) and Late Assyrian period (Level L4) were also published there, although the excavations had not been completed. In 2007 and 2008, work in Operation L concentrated on completing the excavation of levels L3 and L4, as well as the elucidation of two earlier levels dating to

the Early Iron Age (Level L5) and, tentatively, to the Middle Assyrian period (Level L6). Consequently, this report will focus on the stratigraphical and architectural description of levels L3 through L6.

Level L3: Hellenistic Period

The remains of building Level L3 were uncovered in trenches N1070E1030, N1080E1030, and N1090E1030. These remains were located stratigraphically above the Late Assyrian level (L4) in all three trenches and were badly disturbed by the Medieval (L2) pits above. Level L3 comprises walls belonging to two different buildings in the southern and northern parts of the excavated area and three drainage channels in trench N1090E1030. It was also discovered that the courtyard pavement belonging to building Level L4b unearthed in trenches N1080E1030 and N1090E1030 (see below) was expanded by laying pebbles and continued to be used in Level L3, suggesting that there was only a short gap in occupation between these two levels (Fig. 10).

The Level L3 walls in N1070E1030 belong to a two-roomed building. It was not possible to identify a detailed plan or actual floors of this building because of disturbance by Medieval pits in this area. Only parts of the foundations below the floor level were preserved. The wall foundations were 50-60 cm wide and made of small- and medium-sized unworked pebbles held together with mud. A second two-roomed building in grid square N1090E1030 was evidenced by a long wall and partition wall added to the south. Traces show that one-and-a-half brick thick walls were used atop these foundations. The entrance to the building must have been from the north, as shown by the stone door socket found in the eastern part of the wall. Two drainage channels belonging to Level L3 were uncovered to the north of this wall. Drainage channel L-411 extends eastwards along the wall foundation and is cut by a pit (Fig. 11). A second drainage channel to its north is made of baked clay pipes and ends in the same pit.

Two different construction techniques were observed in the pavement unearthed in the southern half of trench N1090E1030 and the northern half of trench N1080E1030. An original baked brick pavement L-455 was carefully constructed (see Fig. 10). The edges of each baked brick were lined decoratively with fine pebbles. We interpret this pavement as belonging to the Late Assyrian building level L4b, the plan of which is described below. Stone pavement L-287, found to the east and west of baked brick pavement, however, belongs to Level L3. The pebble pavement is laid so as to cover mudbrick wall L-770 belonging to Level L4 below (see Fig. 12 for location). A third drainage channel in this paved area was constructed of pebbles and baked bricks removed from the Late Assyrian constructions. The drainage channel, as preserved, is between 10 and 20cm wide and about 7m in length. This channel also cuts the foundation of Level L4b wall L-770 to the east, and also ends in the same pit.

In general, stone was used more frequently in Level L3 than in either the succeeding Medieval (Level L2) or the preceding Late Assyrian (Level L4) buildings. In addition, the drainage channels and baked clay pipes suggest that this period was characterized by significant architectural constructions which unfortunately lie outside the area of excavation. The orientation of the channels suggests that important buildings of

this period were perhaps located in the slightly higher part of the mound to the west of Operation L.

The dating of Level L3 is based in part on the observation that a distinctive type of ceramic ware – triangle-and-festoon ware – is related to this architecture, although most of our examples of this ware come from deep Medieval pits. This type of pottery has been reported from Üçtepe, Kavuşan, Giricano, Salat Tepe and Hirbemerdon Tepe in the upper Tigris River region, as we noted in our previous report (Matney et al. 2007). At Üçtepe, for example, there are two Hellenistic building levels associated with this pottery (Üçtepe Level 5-6) above the Late Assyrian level (Level 7). There are no signs of settlement in between the two periods at Üçtepe. At all of these other sites this painted pottery is associated with levels which post-date the Late Assyrian period. The Ziyaret Tepe finds fit this scenario and, based on all these clues, we propose that triangle-and-festoon ware can be dated to the Hellenistic period (Köroğlu 2008). However, the dating of the building Level L3 to the Hellenistic period leaves several centuries of the Late Iron Age undocumented, as is the case for other mounds in the upper Tigris River basin. Understanding this gap demands further archaeological investigation.

Level L4: Late Assyrian Period

Architecture and small finds of the Late Assyrian period in Operation L point to the existence of an important building centered around an open courtyard in this area during the early phase L4b of the Late Assyrian period. Subsequently, in the later Late Assyrian phase L4a the area was the site of a more modest domestic settlement. Late Assyrian period remains were uncovered in three trenches (N1070E1030, N1080E1030, and N1090E1030) in Operation L. Parts of two Level L4 buildings were uncovered separated by a large courtyard. The northern building is limited to a single room, while parts of several rooms from the building south of the courtyard were investigated. The walls of both buildings were oriented in a NE-SW direction, in line with the slope of the site. Level L3 foundation pits and drainage channels, as well as the deep Medieval pits of Level L2, disturbed the Level L4 architecture. Nevertheless, the work in Operation L provided important data about how the high mound was planned, and the phases that the buildings went through during the Late Assyrian period. Since the later phase (L4a) reused some portions of the earlier architecture (L4b), the earlier phase is presented first.

Late Assyrian Period, Early Phase: L4b

The principal architectural remains from Level L4b are a large building and associated courtyard which extends throughout the three trenches excavated in 2007-2008 in Operation L (Fig. 12). The building site slopes downwards towards the south, while also commanding an overview of the citadel's northern edge and a panoramic view of the Tigris River a few hundred meters to the north. The building and courtyard together measure 25.5m measured north to south and the excavator estimates the total area of the building to be over 500m^2. The plan consists of a large courtyard to the north and associated rooms to the south.

Two walls of the courtyard are located within the excavated area. They are 80-85cm wide and made of mudbricks. Whole (40 by 40cm) and half (40 by 20cm) bricks were used in the construction. The foundation trench for the eastern wall (L-770) is deeper than the others. This wall also functioned as a retaining terrace wall and the interior (western) face of this wall is packed with rubble and pottery sherds up to floor level. The southern courtyard wall (L-795) could be identified only as a thin trace at the foundation level. It seems that the whole area was leveled at the time of the construction of the courtyard and the resulting rubble was deposited in the deeper part.

The surviving remains show that the southern part of the courtyard was paved with baked bricks (L-455), while the northern portion had mud floors. The courtyard pavement was in use through building levels L4b, L4a and partly during L3. In some areas, the disturbed parts of the baked brick pavement were overlaid by stones (L-287) in building Level L3 (Hellenistic period), when drainage channel L-409 was inserted into the middle of the courtyard, as discussed above.

The main entrance of the courtyard is not preserved. It is possible that a small patch of pebble pavement laid partly over the wall marks the entrance to the courtyard from the east. Two door sockets were found by southern wall L-795 of the courtyard. The socket to the west is larger and probably related to the main door leading to the rooms to the south. The smaller socket in the east most likely belonged to a narrower door.

To the south of the courtyard there is a corridor varying in width between 2.0 and 2.6m and a series of three rooms adjacent to the corridor. *In situ* pottery sherds were found on mud floor L-807 of the corridor. The walls and floors of the westernmost two rooms were better preserved. The middle room is 2.8 by 3.6m in extent (Fig. 13). An *in situ* assemblage that allow good dating of the large building with the courtyard comes from these two room floors and includes a grinding stone, pots of various sizes, an almost complete bottle with two handles, and sherds from a Palace Ware dimpled beaker found on floor L-747. While a number of Medieval pits (e.g., L-732, L-710, L-731, and L-702) are cut into the building, this assemblage appears to be otherwise intact. Likewise, *in situ* finds uncovered on floor L-746 in the northeastern portion of the trench were grouped around a rectangular hearth made of bricks. These two deposits, L-746 and L-747, are key to understanding the dating and function of the Level L4b building in Operation L at Ziyaret Tepe.

In L-746, a largish jar and a bowl of Late Assyrian style, along with a grinding stone, were grouped around the hearth. In this group a fragmentary closed-form indigenous Iron Age pot was also found. This is significant evidence pointing to the continued use of this local type, which is generally dated to the Early Iron Age but now clearly continues until at least until the end of Late Assyrian Empire. Other pottery forms, tokens, bronze and iron fibulae recovered in Operation L also support this dating. Finds from L-746 and L-747 are also paralleled by exemplars from Operations A/N, G/R, K, and Q, where extensive Late Assyrian period architecture has been excavated.

Late Assyrian Early Phase: L4b pottery

As noted above, the pottery of Level L4b as represented by two primary floor contexts L-746 and L-747 and consists of known Late Assyrian forms. The assemblage includes a large liquid storage jar missing its rim (Fig. 14a), the rim of a large bottle with burnishing on the exterior (Fig. 14b), two incomplete medium size jars (Fig. 14c, d), another bottle, almost complete, with two handles (Fig. 14e), a pot-stand (Fig. 14f), two deep bowls (Fig. 14g, h), and a palace ware beaker with dimples (Fig. 14i). The fabric of these vessels, with the exception of the palace ware beaker, fits with the most common fabric type observed for the Late Assyrian pottery found at Ziyaret Tepe, as previously described for the assemblage from the public buildings in Operation G (Matney et al. 2007: 45-47, Figs. 18 and 19). This fabric is characterized as a medium quality fabric with brown, orange-brown, and reddish brown colors and occasional to common fine mineral, sparse to occasional fine vegetal, and occasional fine mica inclusions.

Late Assyrian Period, Late Phase: L4a

It is clear that the courtyard pavement stayed partly in use after the collapse of the building at the end of Level L4b. In this later phase a room, of which two walls were exposed, was built over the north edge of the courtyard and a street coming from the east was paved with small pebbles. The street and the room of this phase are stratigraphically situated above the Level L4b phase courtyard but below the Level L3 remains. The eastern wall of the room is built over the Level L4b courtyard wall L-770. Mudbricks in this room are different from those of the earlier phase and are made of red clay with common lime temper. Indistinct traces of walls made of the same clay can be observed in the western section of Operation L within the fill above the courtyard building, but no coherent plan of structures was recovered here. Two complete jars from the northeast corner of trench N1070E1030 can be firmly associated with this phase of occupation.

Level L5: The Early Iron Age

After the removal of the courtyard pavement of the Late Assyrian occupation, Level L4b, a pit (L-831) yielding a group of pottery of a completely different character marked the discovery of a distinct period of occupation in Operation L. Half of this broad shallow pit is located in the western section of trench N1080E1030, and has a 2.4m diameter and a depth of 60cm; the other half lies outside the excavated area (Fig. 15). The dimensions and the structure of the pit do not resemble storage pits. It was entirely filled with fine ash with a very small amount of coal in the ash fill. This fill reminds us of the ashes that remain after the burning of animal dung, which is a continuing tradition in the region. No architecture related to the pit was observed. Early Iron Age pottery was retrieved from within the pit fill. A pot cremation burial (L-839) with a Groovy Pottery bowl placed as a lid on the top belong to this level and were found both stratified below building level L4b and outside of the Pit L-831 (Fig. 16).

Early Iron Age Pottery

The pottery coming from Level L5 is of a completely different character than that of Late Assyrian manufacture. This pottery is a product of a common culture of the Keban and Karakaya regions, the Van basin and Transcaucasia in the north, and the upper Tigris River region in the south (Bartl 2001; Karg 2001; Kozbe 2006; Köroğlu 1998; 2003; Roaf and Schachner 2005; Tekin 2006). This tradition started in the Early Iron Age and continues through the Middle Iron Age at least in the upper Tigris River region.

Level L5 pottery consists of two main types, both of which are represented in the L-831 assemblage. The first type is handmade, and is represented by bowls with grooves (Fig. 17a, c), and other closed forms with (Fig. 17b) or without grooves (Fig. 17d). The fabrics are of medium to coarse quality, with occasional to abundant fine and medium mineral and vegetal inclusions, with colors ranging from brown to pale yellow (see catalog). The second type is a painted ware (Fig. 17e-g). The fabric is of fine to medium quality, with sparse to occasional fine mineral and vegetal inclusions with colors ranging from reddish yellow to very pale brown to pale yellow, and is commonly wet-smoothed. There is red painted decoration on the exterior surfaces and sometimes on the rim.

Level L6: Middle Assyrian Period (?)

In the last week of the excavations in 2008, Level L6 architecture was reached below the Early Iron Age pit that corresponds to Level L5. Only mud floors and traces of mudbrick wall foundations at the same elevation were preserved from this level, which was largely cut and flattened during the construction of the Late Assyrian courtyard. No findings that enable us to unequivocally date this building were uncovered. The architecture has 40-50cm wide walls and packed mud floors, suggesting that they belonged to a domestic building.

Overall, the sequence of occupational levels L4 to L6 in Operation L fits nicely with the stratigraphy of Operation E where, according to Roaf, a Middle Assyrian level was reached immediately beneath the Early Iron Age pit E-071 (Roaf and Schachner 2005). The dating of Level L6 to the Middle Assyrian period is tentative.

An Inscribed Gaming Board from Operation L

During the 2007 season an inscribed baked brick (L-680, ZT 24413) was found in Operation L in a Medieval context (Fig. 18). The brick was 32cm long, 19cm wide, and 7cm thick, common dimensions at Ziyaret Tepe for bricks of the Late Assyrian period. A gaming board covering nearly the entire surface is inscribed on the obverse of the brick. The board consists of a box of twelve squares (3x4) on the right and extending from those squares to the left edge of the brick is a line of six squares. There are most likely two squares extending from the end of that line down, but the details are difficult to make out given the quality of preservation. This layout of squares represents an evolved form of the traditional Game of Ur. The traditional Sumerian game has a box of six squares on the left; these have now been straightened out to form a line of six extending from the box. The

lack of decoration, or method of demarcating unique squares, is characteristic of later layouts (Finkel 2007: 17).

The Game of Ur is most famous from exemplars found in the Royal Cemetery of Ur by Sir Leonard Woolley (Woolley 1934: 274-279). The examples from Ur are highly decorated and inlayed pieces of exquisite beauty. However other examples exist in simpler settings and decoration. For example, a wooden board was found in Iran by an Italian team with a decoration of a coiled snake carved onto its surface (Piperno and Salvatori 1983: 179-191). In the palace of Mari four bricks were found in Courtyard 154 with the same game board inscribed on the obverse (Parrot 1958: 12-13). They were placed in the paving of the courtyard: two by the north wall and two by the south wall. An additional incised brick was found at Mari in Room 47 again in the paving of the floor (Parrot 1958: 182-183). Two bricks were also found at Tell Halaf with the same inscribed game board (Hrouda 1962: Pl. 42, Fig. e and f).

Although the Ziyaret Tepe brick was found in a Medieval context reused as an architectural element, it almost certainly came originally from the Late Assyrian levels below, as the Medieval occupation has badly disturbed the earlier levels, as discussed above. Our brick was probably part of the earlier Late Assyrian pavement where it served as a means for visitors to pass the time while waiting in the courtyard. In the Medieval period it had been re-used as a wall for a storage bin.

EXCAVATIONS IN OPERATION G/R

Excavations in the southwestern portion of the lower town since 2001 have revealed the presence of two large mudbrick buildings comprising over forty rooms dating to the Late Assyrian period (Matney et al. 2005: Fig. 6). These buildings are best known for a series of well-preserved black-and-white pebble mosaic floors using a checkerboard pattern, as well as for a cache of cuneiform tablets. Based on the inscribed material, Parpola has suggesting that the eastern building, Building 1, was perhaps part of a treasury to the Temple of Ishtar (Parpola in Matney 2005: 29-31). The excavations in 2007 and 2008 concentrated on recovering the southern portion of the western building, Building 2, whose precise function remains uncertain. In 2007, portions of a third building underlying the far western edge of Building 2 were observed. The plan of this structure, Building 3, has only been recovered in a few places, and its importance at the moment lies in demonstrating a long Late Assyrian occupation of the area with at least one major phase of rebuilding in the southwestern lower town. A total area of 500m^2 was excavated in 2007 and 2008 comprising five 10m by 10m grid squares (N850E820, N850E830, N850E840, N860E820, and N860E830).

Operation G/R: Post-Assyrian Phase

Generally speaking, the preservation of post-Assyrian remains across Operation G/R is poor and is usually limited to a few pits or an occasional grave. The area south of Building 2, however, presented some *in situ* features which are not precisely dated, but

stratigraphically post-date the abandonment of the Late Assyrian city. These remains comprised three circular bread ovens, a small round pit, and a pottery kiln, all associated with preserved surfaces. An initial assessment of one of the bread ovens (R-025) produced unglazed medieval pottery; the dating of the other ovens is uncertain. The best preserved bread oven (R-028) was placed within a large surface of rough irregular stones (R-032). A similar rough stony surface lay to the east and a further surface of compacted mud and small pebbles was associated with an oval pottery kiln (R-043). These remains represent an area of low-level or domestic production particularly characterized by baking, as indicated by the bread ovens and a number of basalt querns and grinding stones which were also found at this level. Except for the medieval pottery noted above for R-025, an earlier post-Assyrian date is preliminarily suggested by associated pottery and supported by the restriction of these remains to the areas adjacent to, but not spatially overlapping, the major Late Assyrian structures. It seemed that the Late Assyrian building was still standing, although probably in ruins, during the use-lives of these later features. There is no evidence for architecture in Operation G/R during the post-Assyrian period, suggesting that this area was separate from residential settlement, which was probably centered on the high mound.

The excavation of well-preserved pottery kiln R-043 provided details on the construction of such installations in antiquity. The north end of the firing chamber floor was intact with three circular flues along the short end. A deep oval fire pit was preserved below, cutting through the Assyrian period walls beneath. The floor of the oven was a concave surface of close-packed, medium sized stones. The structure is similar to a larger oven found to the north in Operation G in 2004 which was interpreted as a pottery kiln (G-242, Matney et al. 2005: 29, Fig. 9) and a similar interpretation is most likely for R-043. When the fire pit below the oven was excavated, a deposit consisting of two almost complete vessels (ZT 30555 and ZT 30556, both from R-077), four loom weights, and some animal bones was found sitting on top of the ashy lower fill of the oven. This deposit was covered to the top of the fire pit with an unburnt fill rich in greenish slag and debris from the oven structure. Significantly, only the underside of the pots and loom weights were burnt suggesting they were placed on top of the hot ashes after the fire was extinguished for the last time. A possible interpretation is that this is a ritual deposit placed in the oven after its final firing to mark the end of its use-life.

The two vessels from the oven fill (R-077) are not of typical Assyrian types. One of them is a deep bowl (ZT 30555) with a missing foot (Fig. 19b). This vessel is handmade, of medium fabric quality, with occasional fine mineral, mica, and vegetal inclusions, and is burnished on the rim and the exterior surface. The other (ZT 30556) is a trefoil jar with a handle, with the rim broken where it comes to a spout (Fig. 19a). It is also of medium fabric quality with similar inclusions and colors: yellowish red surfaces and reddish brown paste and core (see catalog). The forms of these vessels, together with their stratigraphical location, suggest an early post-Assyrian date. This interpretation is also supported by parallels from other sites. An example of such parallels comes from Bastam in northwest Iran, where forms similar to both vessels have been excavated in Urartian contexts (see Kroll in Kleiss et al. 1988: 208, Fig. 3: 1, 3).

Operation G/R: The Late Assyrian Phase

The area excavated in 2007-2008 covered five trenches, as noted above. Both the southern and western limits of Building 2, a large structure of Late Assyrian date, were reached in Operation G/R. Six rooms were added to our previous plan of Building 2 (Fig. 20). At the same time, a series of four small rooms abutting the southern wall also appear to be contemporary with Building 2, as discussed below. Building 2 was planned around a large, roughly square Courtyard 11 with a pebble mosaic floor. The mosaic marked the easternmost and southernmost excavated area of the building prior to 2007. Excavations now show that Courtyard 11 is surrounded by two rooms to the south (Rooms 39 and 37) arranged as a single range of rooms. The western edge of Courtyard 11, on the other hand, is bordered by a double range of rooms (Rooms 27, 26, 30, 31, and 32), although there appears to be an internal division separating Rooms 31 and 32 and creating two very small spaces. The function of Room 33 is discussed below.

The completion of excavations in Courtyard 11 revealed a pebble-paved gutter running along the south side of the pavement. Projecting from the east wall of the southeastern courtyard corner, a steep pebble-paved ramp was found rising from the level of the courtyard pavement, through a turn of 90º, up to a higher level of pebble-paving. Only a fragment of this upper level was preserved just below the topsoil in the very north-east corner of the trench. This ramp appears to have been a later addition built over the courtyard paving. A short mud brick retaining wall was added to the south side of the ramp at a later point following the partial collapse of the southern side. This ramp suggests the existence of a second storey in Building 2, access to which was achieved in the building's later phase directly from Courtyard 11.

A doorway in the southern wall of Courtyard 11 led to a large, roughly square entrance hall, Room 37. Room 37 had three doorways. The doorway leading from Room 37 into Courtyard 11 was paved with large threshold stones which formed a step down into the room from the courtyard level. A similar stone paved doorway led south out of Room 37 to an outside area. The third doorway led east to an adjacent room (Room 25); here the doorway floor was a compacted mud surface at the same level as the floors in both rooms. On excavation, Room 37 was found to be filled with layers of ashy building collapse full of layers carrying the impression of reed matting and lumps of heat-hardened mudbrick. One extensive collapse layer near the floor level was interrupted by linear strips which seem to be decayed roofing beams. This appears to have been the ceiling of Room 37 with the material above representing debris from an upper storey room. From this debris over 300 small clay tokens were recovered, mostly concentrated in an area in the southwest of Room 37. They seem to have been dispersed within the fill as they fell from the upper storey.

To the west of Room 37, a long Room 39 runs along the south side of the courtyard. In the center of the floor, four baked bricks form the support for a column or other heavy object. To the west of this, a small Room 28 paved with baked bricks was found. One of the paving bricks near the southern side of the room had a round hole through it. The brick then connected to a subterranean baked brick drain running south. This was clearly another bathroom.

To the south of Building 2 lay a large external area (marked as 38 on Fig. 20) with a rough pebbly surface containing a small bread oven. This area gave access to a series of structures adjacent to the southern side of the main building. Against the exterior southern wall of Building 2 a small three-sided chamber (Rooms 40 and 43) opening southwards had been built, with a similar chamber (Room 42) facing it across a roughly paved path. This path runs into a further small room with a drain running under it (Room 41). To the west, the pavement runs around two sides of the southern three-sided chamber and into the south west corner of the trench. The buildings to the south of Building 2 are less solidly built and less well preserved than the main building itself. It seems likely that these were rough structures for workshops or animal keeping, possibly stabling, and were not residential spaces.

The western range of rooms excavated in Operation G/R in 2007-2008 included a classic Late Assyrian bathroom (Room 27) set off of the western side of Courtyard 11 (Fig. 21). Room 27 measured 2.5m by 3m and was paved with a floor of baked bricks set in bitumen. There was a gap in the eastern side of this paving measuring 0.75m by 1.2m, undoubtedly the site for a stone drain slab which was either robbed out or never installed. Near the north side of the room was the aperture to a drain consisting of a baked brick with a 12cm diameter hole through it. Removal of this and the adjacent brick revealed a baked brick channel running southwest. Bathroom 27 was accessed from Courtyard 11 via a connecting room (Room 26) measuring 3.5m by 4.5m. This room clearly functioned as an antechamber and, as such, was perhaps a changing room. There were very few finds on the floor of Room 26 although in the upper debris a few tokens were found along with a broken cylinder seal (G-911, ZT 22400). At some stage in its use-life, the entrance from Courtyard 11 into Room 26 was blocked. An extension of the cobbled pavement marks where the threshold was, but the corresponding doorway in the wall could not be found despite close attention. Perhaps this was the same time at which the majority of the baked bricks laid in the entrance between Room 26 and Room 27 were robbed out.

The southwest corner of Building 2 comprised an area cut by a number of pits. This area was designated Room 33, although the line of the walls here was not clear. It is possible that this area may not have been a room as such but rather part of an outside area. This would mean, however, that the overall layout of the building was unorthodox, i.e. the building does not form a rectangle but has an irregular jig in the southwest corner. The initial reason for proposing that this was an open space is that the western wall of the building could not be identified in the southwest corner, but there is also a plausible explanation for the arrangement in that a substantial septic tank was cut into the floor of Room 33. It would make sense that the architect would avoid including such a feature within the walls of the building. The tank itself was lined with large cobbles and baked bricks and had an internal diameter of 1m. It was excavated to a depth of 2.5m, at which point work had to be suspended due to safety considerations. Higher up in the deposit, the fill was of dark cohesive soil, changing to a lighter brown soil with a sandier composition lower down. The lowest excavated level contained no large pieces of pottery. Finds from the upper levels, in addition to pottery and bone, contained a cylinder seal (G-962, ZT 22605) and a cowrie shell (G-962, ZT 22606). Approximately 60cm from the top of the tank a baked brick channel with a gentle slope led into the shaft from the northeastern

side. This would appear to connect with the drain leading out of Bathroom 27 and confirms that the feature is a septic tank and not a well. Comparative levels show that the septic system maintained a fall of 42cm over 6m, or a 7% grade. The sandy fill in the cesspit is very similar to the fill found in the drain in the bathroom. The pottery from this area, on first impression, is the standard Late Assyrian assemblage, as described for the Operation G pottery in our previous report, noted above. Further fine-grained analysis may reveal both functional and perhaps even chronological distinctions within the Late Assyrian corpus.

EXCAVATIONS IN OPERATION Q: THE "KHABUR GATE"

In 2007 we commenced excavations in Operation Q, the site of a major gateway into the city through the southern fortification wall. The location of this gate was revealed by a very clear image in both magnetic gradiometry and electrical resistivity surveys which showed a chambered gate with projections (Matney and Somers 1999: 210-211, Fig. 7; Matney and Rainville 2005: 40-42, Fig. 14). The aim of Operation Q was, therefore, not so much to recover the plan of the gate as it was to gain insights into the occupational and architectural history of the complex. Nevertheless, in terms of the actual excavation, identifying outlines of the walls to "ground-truth" the geophysical surveys was a priority. One difficulty encountered was in identifying the mudbrick wall lines and mortar joins themselves until significantly below the surface. This is a result of at least three factors: (1) the site has been severely disturbed by ploughing, irrigation ditches, root action and animal holes; (2) the presence of a large number of pits cut from above; and (3) the poor quality of the mudbrick itself.

Our work during 2007-2008 in Operation Q yielded a much more detailed picture of the city gate than was accessible through geophysical survey alone (Fig. 22). In the course of two seasons, we opened up two 10m by 10m grid squares (N750E890 and N760E890), as well as half of the grid square to the east (N760E900). The northern half of this area covered the gate chambers while the southern half revealed the street leading in between the projecting buttresses flanking the gate. In the gate itself we were able to identify at least three major phases of construction and occupation. The lowest phase (Phase 1) was characterized by a 3m-wide pebble road, with a curious stone block in the middle of the thoroughfare. The second phase represented a major reconfiguration. Phase 2 walls were built on top of the Phase 1 surfaces and the area of the gate was very significantly enhanced: the floor level was raised by laying a low platform of mudbricks and massive slabs of grey limestone were installed in the threshold itself. A number of distinct floors were associated with this phase. In the eastern chamber, the last level of the Phase 2 flooring, running under the Phase 3 wall, appears to present the most intact deposit of *in situ* material identified so far in Operation Q. Features within the eastern chamber include a narrow mudbrick partition wall, a hearth, and a bin (not shown). In Phase 3, the massive slabs were themselves covered over and the level of the passage was raised once again. Curiously only one door socket was found for each of the earlier

phases (that of Phase 1 on the east, that of Phase 2 on the west) and none for Phase 3, perhaps because the missing sockets had been re-used elsewhere on the site.

The three phases of construction inside the gate correspond closely with the sequence that emerged from excavations of the street leading up to the gate. This was a cobbled street, very well constructed by first laying down a bed of local clay on top of which was laid a layer of larger cobbles (up to 20cm in diameter) and then a band of smaller pebbles (up to 6cm in diameter) on top, the whole construction totaling about 40cm thick in all. The sequence (clay, then large pebbles, then small pebbles) was replicated three times. The top two streets demonstrably corresponded to the top two constructional phases of the gate itself, and at this stage it seems highly likely that the lowest level of the street corresponds to Phase 1 of the gate.

A large number of small potsherd fragments were present in the highest surface. By contrast the lowest pebble surface contained very little in the way of ceramics, but it did contain a large number of baked clay objects: "Hands of Ishtar" and square pegs up to 15cm long. There were at least 25 fragmentary examples of these in a small sounding excavated at the northern end of the street. It was very satisfying that in one case we were able to make a join, completing a whole hand of Ishtar consisting of the lion's paw molded onto the peg with which it would have been fixed to the wall. This allowed us to solve the mystery of identifying the various other pegs which had from time to time been found around the site.

It is noteworthy that the plan of the area outside of the gate is not symmetrical, at least in its final phase. The eastern projecting wall continues straight out from the door of the gate, whereas on the western side it is offset by 2m to the west. It does not appear that this arrangement existed in the earlier phases. The projecting walls were approximately 10m long. They were not excavated to their full width but from the resistivity it can be seen that the projections were approximately 8m, forming massive towers to guard the entrance to the city.

Abutting the gate complex, in the northwest corner of N760E890 we uncovered one small room of a domestic unit which had been built right up against the gate complex. The room was defined by a wall two bricks thick on the western side. The practice of constructing domestic structures abutting the interior of the city fortifications in Operation Q has close parallels with more extensive domestic architecture excavated in Operation K in previous seasons (Köroğlu in Matney and Rainville 2005: 31-35, Fig. 10).

Operation Q Graves

There were graves in both the street and the gate complex in Operation Q. In the street, there were at least four areas where post-Late Assyrian graves may have been cut into the street, two marked by small mounds of stones and two by patches of broken baked bricks. None of these were excavated. Additionally, in the gate area there were three graves (Q-037, Q-043, Q-093) neatly dug along the inner walls of the western chamber of the gate, all of which were excavated. Each grave contained a single burial. All were mature adult males; the preservation of the bones was not always good.

Grave Q-037 was badly disturbed by animal action. The skeleton was not well preserved and no preserved grave goods accompanied the body. The occupant of the grave was a male aged between 35 and 45 years based on the robusticity of the bones and tooth wear.[12]

The skeleton in Grave Q-043 on the whole was very well preserved, with some bones missing due to animal action around the left arm and ribcage (Fig. 23). Preliminary study suggests the occupant of the grave was a male aged between 25 and 35 years based on mandibular molar wear and the morphology of the pelvis which was well preserved. Finds with the body in Q-043 included: a bronze fibula (ZT 27298) *in situ* at the right shoulder; and six accompanying ceramic vessels: a fine ware beaker (ZT 31170) located inside a cylindrical pot (ZT 27262), a dish (ZT 27307) sitting on a tortoise shell (ZT 27319), a carinated bowl (ZT 27308) in which the right hand was resting, a two-lugged storage vessel (ZT 27306), and a globular flask (ZT 31171).

In Grave Q-093, the skeleton was also badly preserved. The occupant of the grave was a male aged between 35 and 45 years based on tooth wear and the robusticity of the femur and tibia fragments. Grave goods in Q-093 included an iron fibula (ZT 27292) *in situ* in the area of the right shoulder and two accompanying ceramic vessels: a palace ware-like beaker (ZT 27310) and a dish (ZT 27311).

Although all of these graves clearly cut through the Phase 2 flooring, it was only in the case of Grave Q-093 that the cut was observed from higher up, from a level where it clearly cut through the mudbrick collapse fill of the chamber (and indeed partially cut the northern wall of the chamber itself). However, the neat arrangement of the three burials makes it certain that they are contemporary and accordingly all three may be assigned to an immediately post-Late Assyrian period. After preliminary study, we might suggest a possible Late Iron Age or early Achaemenid date, although the finds require further analysis.

EXCAVATIONS IN OPERATION P

Operation P was excavated during the 2007 excavation season. Here we hoped to explain the presence of a large circular geophysical anomaly seen previously during electrical resistance survey (Matney et al. 2007: 48-49; Fig. 22). Excavations in Operation P were carried out along a 5m by 15m area in grid squares N820E930 and N820E940 in the western lower town. Near the modern surface, our excavations recovered a number of ancient cobbled surfaces which did not extend across the entire trench, but rather formed a complex series of partially overlapping exterior spaces. The pottery from this area was almost entirely Late Assyrian in date suggesting that, whatever their function, these surfaces belonged to that period. Three notable features were recovered. First, a well-constructed drain similar to those found elsewhere at Ziyaret Tepe was found running across the NE corner of the trench. This comprised a stone-lined drainage channel with

[12] We would like to acknowledge Jennifer Walborn for her preliminary analysis of the human skeletons from Operation Q.

large flat stones set over the top of the drain. The second feature was an intrusive burial cut into the northern portion of the trench down to a depth of approximately 1.0m. This burial appears to disturb a very deep feature consisting of fine gravels which fill a linear ditch nearly 80cm deep. The fine gravel deposit perhaps represents the foundations of a roadway. A deep sounding across the trench to a depth of 2.5m failed to reveal the nature of the circular geophysical anomaly. There were no walls found in this trench, suggesting the area functioned as a large open space in Late Assyrian times.

PRELIMINARY REPORT ON THE ZIYARET TEPE GROUND STONE ASSEMBLAGE

A majority of the ground and polished stone (hereafter ground stone) excavated at Ziyaret Tepe between 2000 and 2008 has now been examined. Ground stone is defined here, following Wright and Adams, to include stone that has been ground or polished as well as stone artifacts used to grind other materials (Wright 1992; Adams 2002: 1). Out of the 631 pieces of ground stone analyzed, 89% were recorded for their form, function, raw material, and dimensions. The ground stone from Ziyaret Tepe presents a unique opportunity to examine the use of stone at one site over a long period of time, from the Early Bronze Age to the Ottoman period. This range is particularly useful since there are few studies of ground stone from the Bronze and Iron Ages in the Near East (Ebeling 2003; Rowan and Ebeling 2008). About 73% of the ground stone assemblage (n = 459) has been assigned a date so far, providing a large sample of material for diachronic analyses. Of the dated pieces, 25% are from the Late Assyrian period and 24% from the Medieval period, with another 22% from modern contexts. The remainder date to the Bronze Age (11%), Ottoman (6%), Late Iron Age/Hellenistic (5%) and Middle Assyrian (4%) periods, and a few from the Early Iron Age (3%).

The ground stone assemblage was divided into forms using a typology adapted from one developed for the prehistoric Near East (Wright 1992), with additional categories created for grinding stones and vessels. These types are strictly morphological and not necessarily functionally specific (Wright 1994). The major forms found in the assemblage (combining all time periods, n=631) are grinding stones (15%) (Fig. 24a, b), vessels (15%) (Fig. 24d, e), handstones (12%) (Fig. 24c), and door sockets (10%) (Fig. 24g). Mortars and pounders/pestles (Fig. 24f, h) each made up 4% of the assemblage and weights make up 2%. The predominance of these types parallels findings nearby at Middle Bronze Age Hirbemerdon Tepe, where their major types are also grinding stones and mortars as well as pounders/pestles (Schwartz 2008: 193). The remaining 38% of the Ziyaret Tepe assemblage is composed of other forms in less significant frequencies, in types ranging from weapons (maceheads and axe/celts) to loom weights and spindle whorls.

The ground stone pieces are made of raw materials that vary from coarse basalt, limestone, and conglomerate to finer-grained stones such as serpentine and alabaster. Patterning is evident in the types of raw material used for particular tools; for example, the majority of grinding stones (91%), handstones (88%), and mortars (78%) were made out of basalt. Of the various types, only door sockets were made predominantly of limestone instead of basalt, with a greater proportion of limestone being used in the

Medieval period (85%) compared to the Bronze and Iron Age (45% and 50%). Fine-grained materials were common in vessels.

The major common tool forms show little variety and continue in the same form for long periods at Ziyaret Tepe. The vast majority of the grinding stones are of the saddle-shaped quern type, found in Middle and Late Bronze Age contexts and also found through the Late Assyrian and into the Medieval period at the site (Wright 1992: Type 6). One sub-type of these grinding stones has a groove extending longitudinally across the dorsal side (Fig. 24b), and these so far have been found at Ziyaret Tepe dating to the Late Assyrian period and later. The most common handstone type, a bifacial planoconvex form suited for one or two hands, is present from the Middle Bronze Age through the Ottoman period (Wright 1992: Types 35 or 43). One diachronic shift is the great prevalence of vessels dating to the Late Assyrian period, which make up one third of all the vessels analyzed. A minimum of 15 stone vessels in fine-grained materials such as alabaster, serpentine, and low grade marble or dolomitic limestone were found, mostly from Operations A/N where a number were placed in the pyrotechnical installations discussed above. The stone bowl profiles copy 7th century BC Palace Ware ceramic forms (A. Keskin, pers. comm.; Searight et al. 2008: 51-53, with further references; examples from Assur assembled by Miglus 1996: Pl. 58, 59) and the alabaster or calcite lug-handled jars resemble ovoid jars typical in Egypt in the Third Intermediate Period (Aston 1994: 162-3; Searightet al. 2008).

Continued study of the ground stone from Ziyaret Tepe will provide more data on the relative persistence of the major tool types over the long occupation of the site. In addition to diachronic patterns, research will also concentrate on the fine-grained stone vessels, raw material sources, and intra-site spatial distribution of the various tool types.

REVISED CHRONOLOGY

Since the inception of the Ziyaret Tepe project in 1997, one of the primary goals has been to document the long occupational sequence of the site. Our initial chronological chart of the city, published after the 1997 surface survey season, was based on the few ceramic parallels made between the largely unknown materials of the upper Tigris River valley and outlying areas with better documentation, such as northern Syria and Iraq, and the Euphrates River valley to the west (Matney 1998: Fig. 16). Numerous surveys and excavations have taken place over the past twelve years in the upper Tigris River valley and it is appropriate now to revise our chronological chart (Fig. 25). Most importantly, we have removed reference to the Neolithic and Chalcolithic periods since there is no clear evidence from our excavations that Ziyaret Tepe was occupied at these times. Rather, we now posit a long unbroken sequence from the Early Bronze Age through the Middle Iron Age. Significantly, we have also added important new information on the periods after the collapse of the Assyrian Empire through excavations in Operations L, J, and G/R, such that we now have a much firmer grasp of the dates and nature of the post-Assyrian use of the site than we were able to discern from surface surveys alone. Continued work at Ziyaret Tepe in future seasons will lead to further modifications and improvements of this chronology of the settlement.

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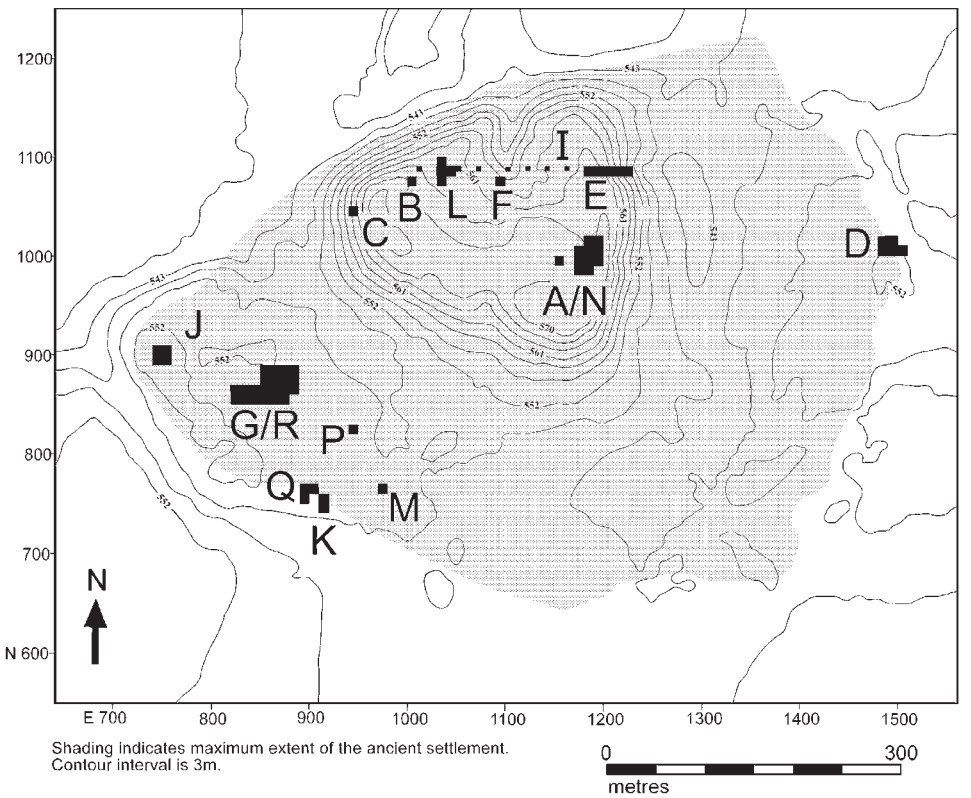


Fig. 1. Topographic plan of Ziyaret Tepe showing areas of excavation, 2000-2008. Work in the past two seasons has concentrated on Operations A/N, L, G/R, P, and Q.

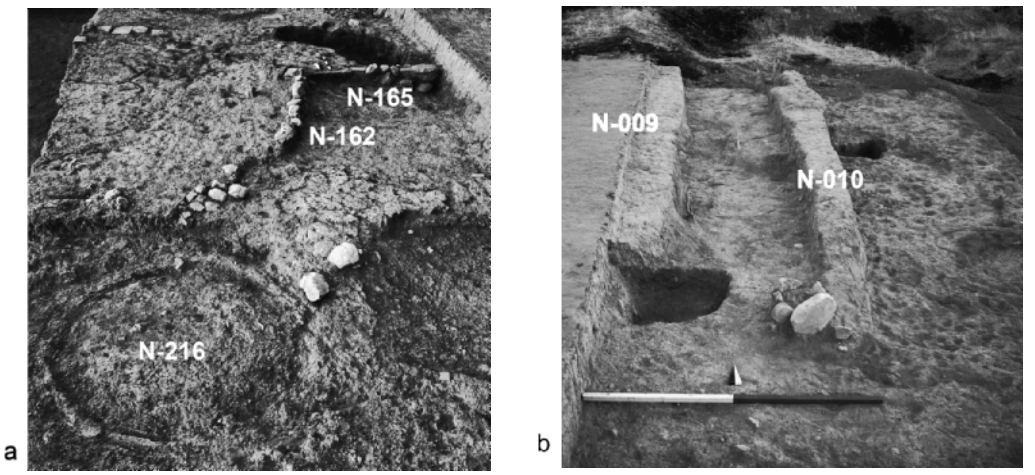


Fig. 2. Operation A/N. (a) Architecture belonging to the Ottoman period, Level N1, facing south. Features shown here belong to Room 1. (b) Two walls of Level N2, showing the type of construction used in the Medieval buildings, facing north.

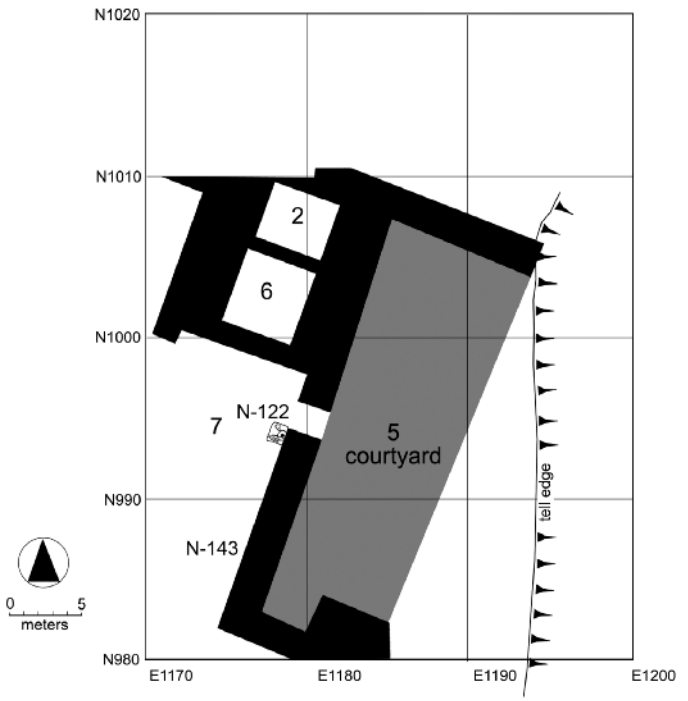


Fig. 3. Operation A/N. Architecture belonging to the Late Assyrian period, Level N4, late phase.

Fig. 4. Doorsocket chamber (N-122) consisting of a reused pivot-stone, the chamber and three-stepped coverstone.

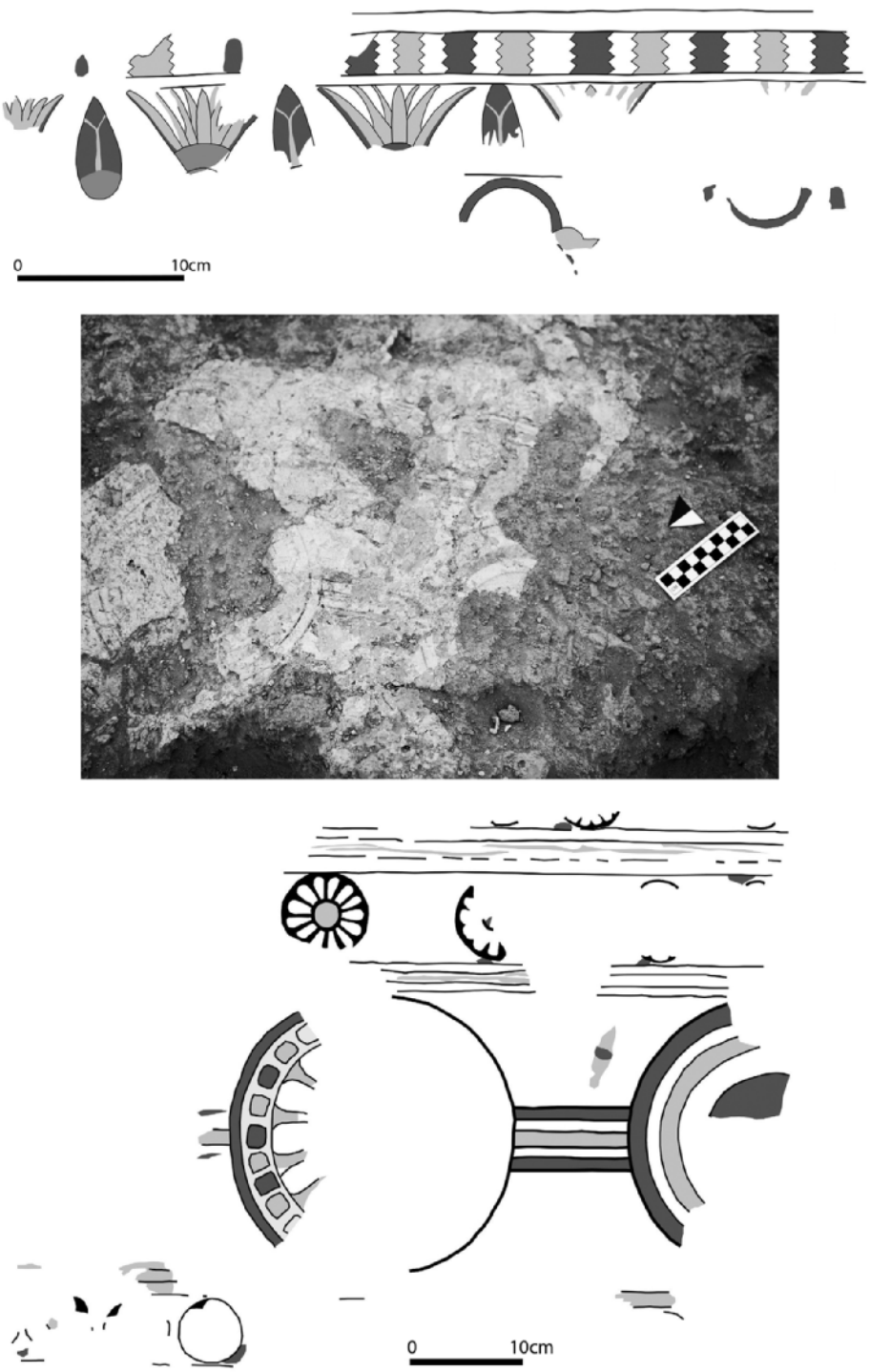


Fig. 5. Fallen wall paintings in the courtyard of the Bronze Palace in Operation A/N. Above: locus N-247. Middle: locus N-266 during excavation. Below: locus N-266.

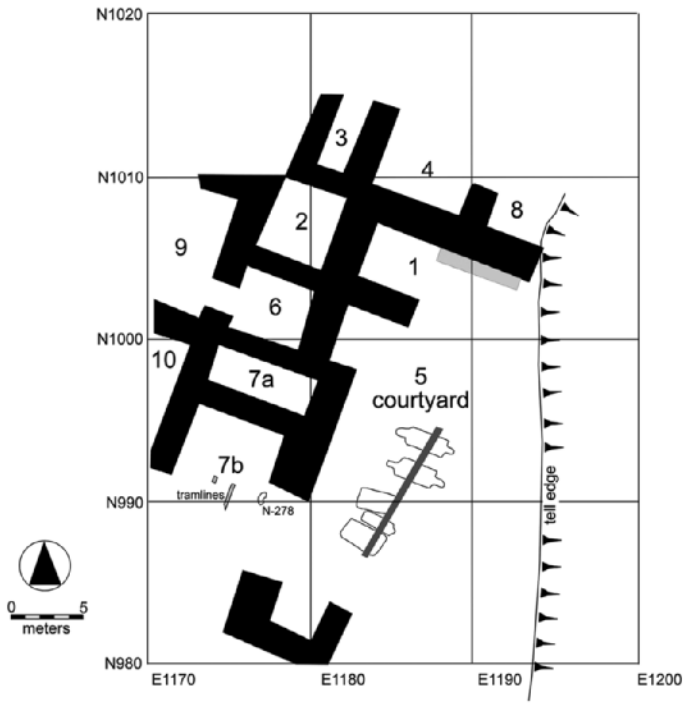


Fig. 6. Operation A/N. Architecture belonging to the Late Assyrian period, Level N4, early phase.

Fig. 7. Photograph of pyrotechnical installation N-070 in Operation A/N. Note that baked bricks from the surrounding pavement to the south and east were removed before this photograph was taken.

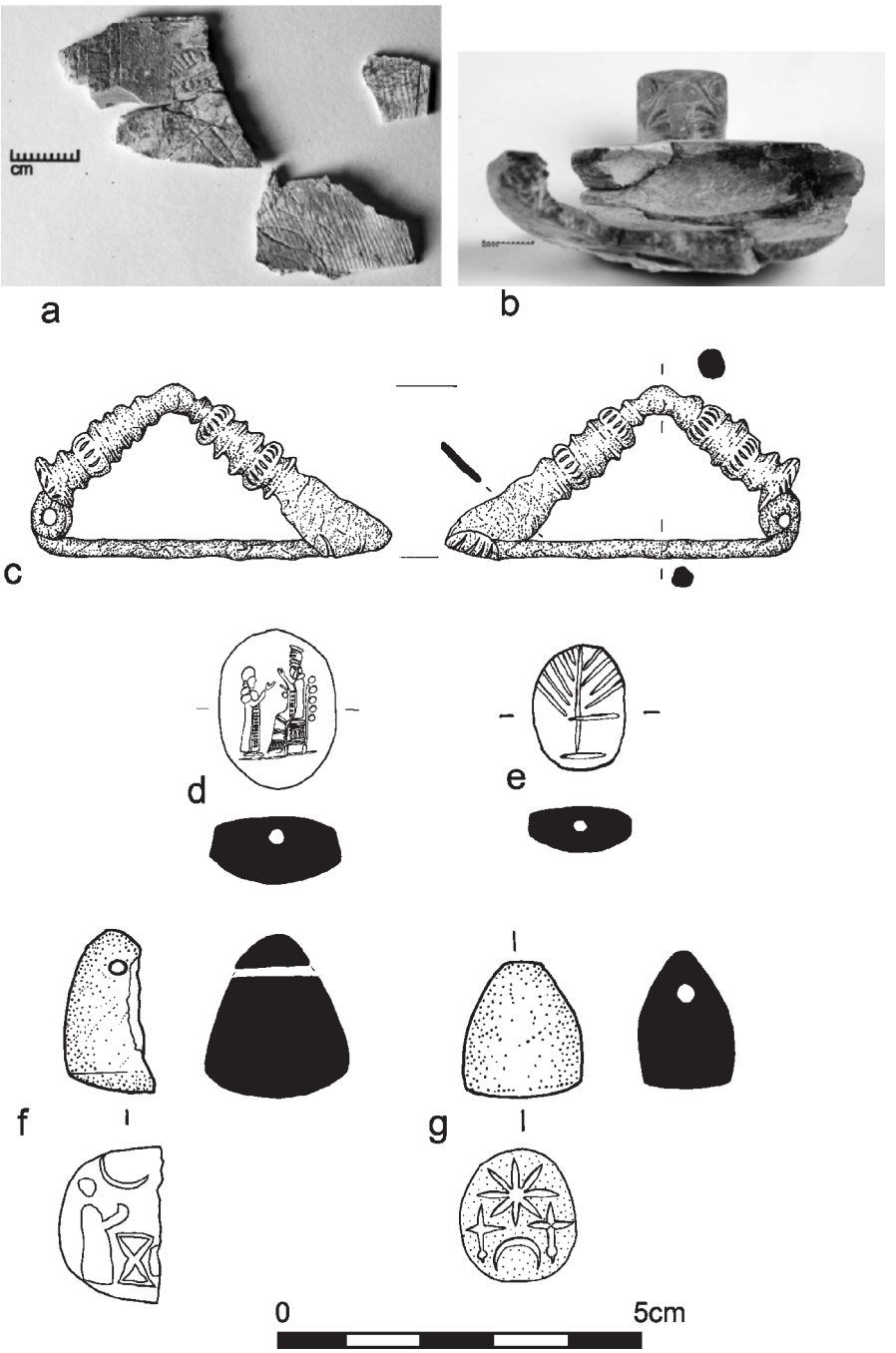


Fig. 8. Small finds from Operation A/N: (a) engraved and burnt ivory fragments N-249, ZT 29636; (b) ivory dish with figurative handle in the shape of a hawk's head N-249, ZT 29615, note different scale; (c) bronze fibula N-249, ZT 29610; (d) stamp seal N-056, ZT 25244; (e) stamp seal N-070, ZT 25505; (f) stamp seal N-070, ZT 25349; (g) stamp seal N-249, ZT 29612.

Late Assyrian Period, Operation A/N

Domestic species	Adult	Subadult	Juvenile	Infant	% of total
Bos taurus	73	102	32	1	25.4
Canis familiaris	3	2	1	1	0.9
Capra hircus	17	29	13	0	6.5
Equus caballus	12	6	2	0	2.5
Equus sp.	7	8	0	0	1.8
Gallus gallus dom.	0	2	1	0	0.3
Ovis aries	24	32	8	1	7.4
Ovis/Capra	35	160	88	19	39.9
Sus scrofa dom.	16	45	28	4	12.6

Wild	Adult	Subadult	Juvenile	Infant	% of total
Bos primigenius	1	1	0	0	0.2
Capreolus capreolus	0	2	0	0	0.3
Cervus elaphus	5	2	0	0	0.8
Dama dama	0	0	1	0	0.1
Lepus sp.	1	1	0	0	0.2
Sus scrofa fer.	2	0	0	0	0.2
Anas platyrhynchos	0	1	0	0	0.1

Medieval Period, Operation A/N

Domestic species	Adult	Subadult	Juvenile	Infant	% of total
Bos taurus	127	183	58	2	26.6
Canis familiaris	0	3	1	0	0.4
Capra hircus	35	61	18	2	6.7
Equus asinus	1	2	0	0	0.2
Equus caballus	9	19	3	1	1.9
Ovis aries	29	70	15	0	6.9
Ovis/Capra	54	327	154	23	39.2
Sus scrofa dom.	27	89	54	6	11.3

Wild	Adult	Subadult	Juvenile	Infant	% of total
Bos primigenius	3	0	0	0	0.2
Canis lupus	0	1	0	0	0.1
Capreolus capreolus	5	5	1	0	0.6
Cervus elaphus	3	6	0	0	1.0
Cervus/Dama	2	0	0	0	0.2
Lepus sp.	0	3	0	0	0.2
Sus scrofa fer.	1	0	1	0	0.2

Fig. 9. Frequency distribution of age classes by taxon for the Late Assyrian and Medieval assemblages from Operation A/N. Note that these numbers represent the NISP of ageable specimens only.

Fig. 10. Pavement in Operation L, showing later repairs in Level L3 to the Late Assyrian baked brick pavement L-455. Notice the reuse of doorsockets in a repair to the pavement towards the bottom of the photograph. The stone pavement is L-287.

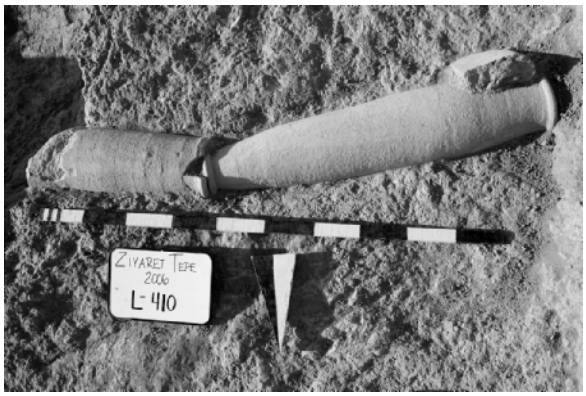


Fig. 11. Ceramic drainage pipes (L-410) *in situ* from Level 3 dated to the Hellenistic period.

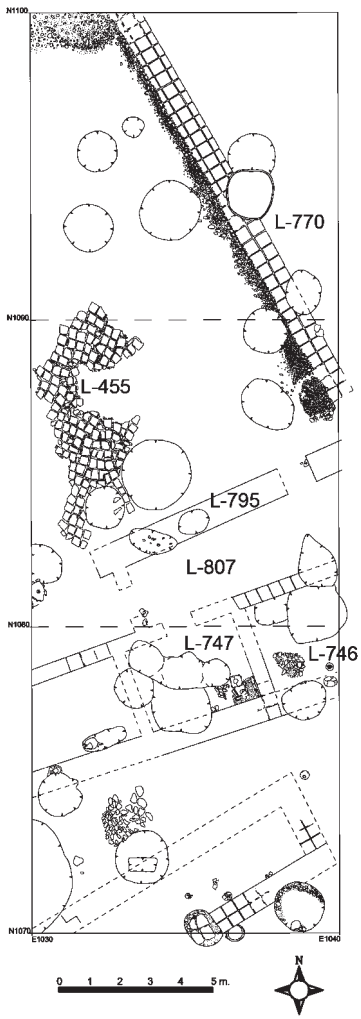


Fig. 12. Plan of Late Assyrian architecture in Operation L, Level L4b.

Fig. 14. Ceramic catalogue

a) L-747 ZT 24559/1
Large liquid storage jar, missing its rim, reconstructed. Medium fabric quality. 7.5 YR 6/4 light brown exterior surface, 2.5 YR 6/4 reddish brown interior surface, paste and core. Occasional fine black and white mineral, mica, and vegetal inclusions.

b) L-747 ZT 24562/1
Rim and neck of large bottle, reconstructed from sherds from ZT 24561 and 24562. rim diameter: 9 cm. Medium fabric quality. 10 YR 8/4 very pale brown exterior surface, 10 YR 8/4 very pale brown (upper part) and 10 YR 5/1 grey (lower part) interior surface, 10 YR 5/1 grey paste and core. Occasional fine black and white mineral, occasional fine mica and vegetal inclusions. Slipped on the exterior and upper part of the interior surface, burnished on the exterior surface.

c) L-747 ZT 24564/1
Neck and shoulder of medium jar. Medium fabric quality. 7.5 YR 6/4 light brown exterior and interior surfaces, 7.5 YR 4/1 dark gray paste and core. Occasional fine black and white mineral, occasional fine mica, and occasional fine vegetal inclusions. Wet-smoothed.

d) L-747 ZT 24561/1
Medium jar, missing rim and base. Medium fabric quality. 5 YR 5/4 reddish brown exterior surface, 5 YR 5/4 reddish brown (upper body) and 5YR 5/1 grey (lower body) interior surface, 5YR 6/6 reddish yellow paste and core. Occasional fine black and white mineral, occasional fine mica, and sparse fine vegetal inclusions. Wet-smoothed.

e) L-747 ZT 24568
Bottle with two handles, missing the base, which probably was rounded/conical. Fine-medium fabric quality. Rim diameter: 8 cm. 5 YR 6/6 reddish yellow interior and exterior surfaces, paste, and core. Occasional fine black mineral, occasional fine mica, sparse fine vegetal inclusions.

f) L-747 ZT 24562/2
Potstand. Medium fabric quality. 5 YR 6/4 light reddish brown exterior surface, 5 YR 5/6 yellowish red (lower part) and 5 YR 4/1 (upper part) dark grey interior surface, 5YR 2.5/1 black paste and core. Occasional fine black, common fine mica, common medium vegetal inclusions.

g) L-746 ZT 24569/1
Bowl. Medium fabric quality. 5YR 5/6 yellowish red exterior and interior surfaces and paste, 5YR 4/1 dark grey core. Occasional fine black mineral and mica, occasional fine and sparse medium vegetal inclusions.

h) L-746 ZT 24569/2
Bowl. Medium fabric quality. 2.5 YR 5/6 red exterior surface, interior surface not visible due to encrustation, 2.5 YR 5/6 red paste, 2.5 YR 4/1 dark reddish grey core. Occasional fine black mineral, mica, and vegetal inclusions.

i) L-747 ZT 24563
Palace ware dimpled beaker. Fine fabric quality. Rim diameter: 8 cm. Incomplete, reconstructed from sherds. Fine fabric quality and thickness. 5Y 8/3 pale yellow exterior and interior surfaces, 2.5 Y 7/4 pale yellow paste and core. No visible inclusions.

Fig. 13. Pottery *in situ* on floor in L-747, from the earlier phase of the Late Assyrian occupation in Operation L.

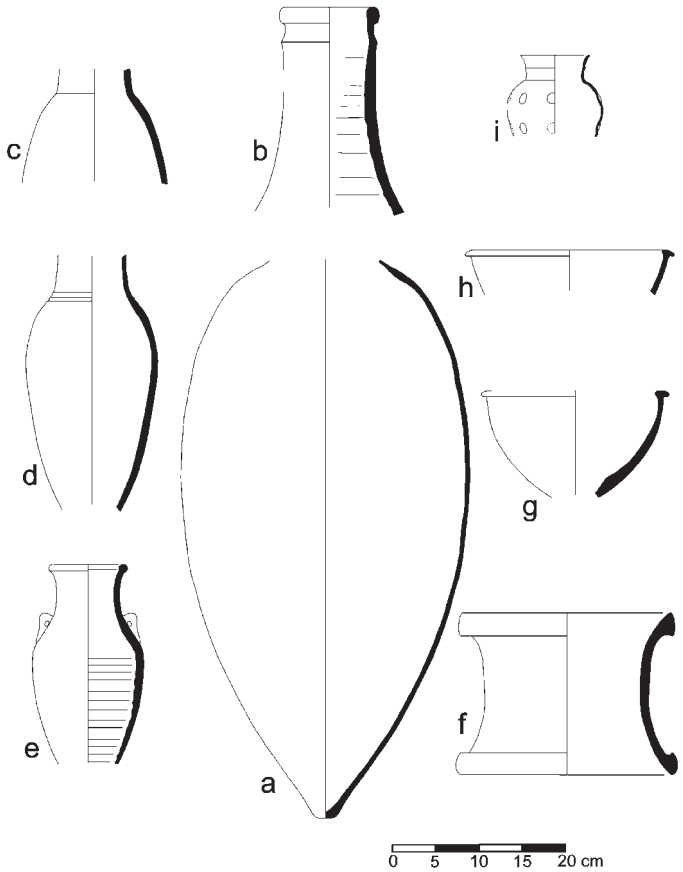


Fig. 14. Late Assyrian period pottery from L-747, Level L4b.

Fig.15. West section of Operation L, Trench N1080 E1030, showing the location of L-831.

Fig. 16. Pot burial L-839 as recovered adjacent to the excavation baulk. Note the small hole drilled below the rim of the lower vessel. The remaining sherds of the upper vessel were recovered and the vessel restored.

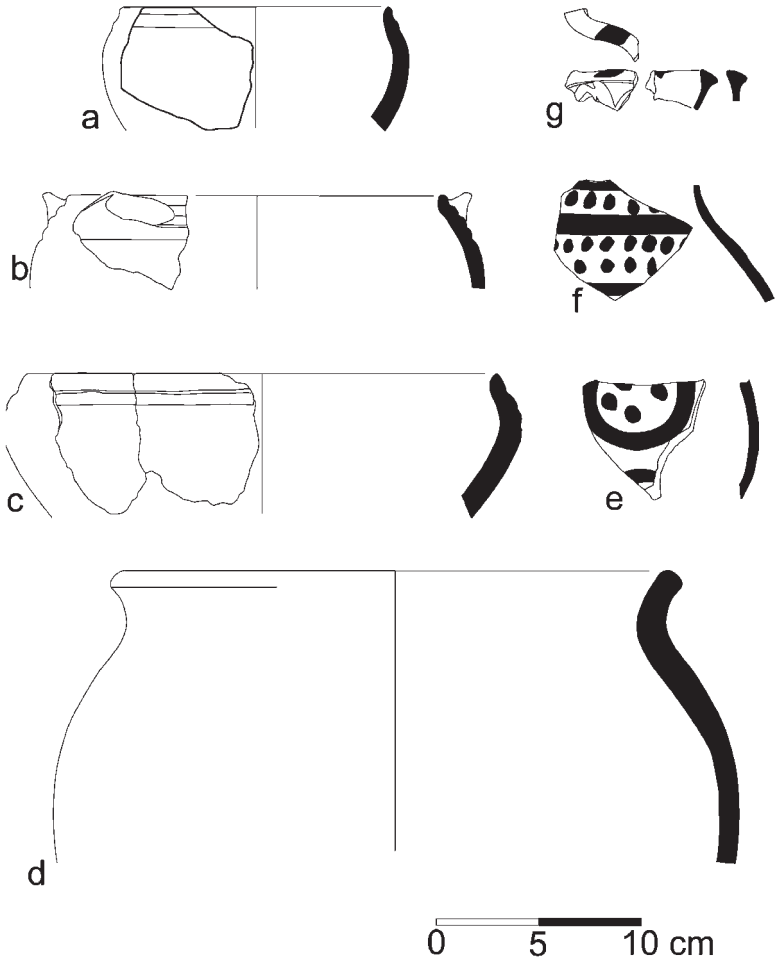


Fig. 17. Early Iron Age pottery from L-831, Operation L, level L5.

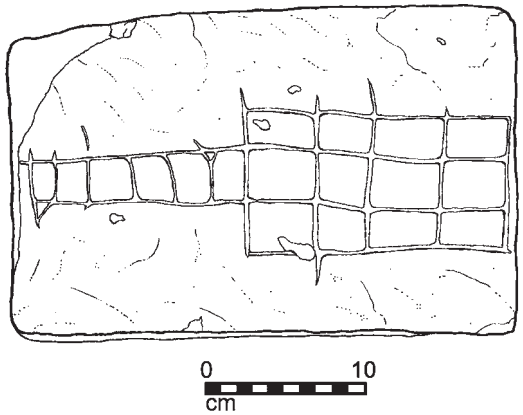


Fig. 18. Late Assyrian gaming board (L-680, ZT24413).

Fig. 17. Ceramic catalogue

a) L-831 ZT 28495/19
Handmade bowl rim. Medium fabric quality. 7.5 YR 6/4 light brown exterior and interior surfaces and paste, 7.5 YR 6/1 grey core. Occasional fine black and white mineral, mica, and vegetal inclusions. Wet-smoothed.

b) L-831 ZT 28471/15
Handmade. Medium fabric quality. 7.5 YR 5/4 brown, and &.5YR 2.5/1 blackened (lower part) exterior and interior surfaces and paste, 7.5 YR 3/1 very dark grey core. Abundant fine and medium white mineral, occasional fine mica inclusions. Horizontally burnished, especially nicely on the exterior.

c) L-831 ZT 28471/1
Handmade bowl. Rim diameter: 23 cm. Coarse fabric quality. 5 Y 8/2 pale yellow exterior and interior surfaces, 5 Y 7/3 pale yellow paste and core. Occasional medium black mineral, common medium white mineral, occasional fine mica, abundant fine and medium vegetal inclusions.

d) L-831 ZT 28495/44
Pot rim. Coarse fabric quality. Rim diameter: 18 cm. 5Y 8/3 pale yellow exterior and interior surfaces, 10 YR 7/4 very pale brown paste and core. Occasional fine black mineral, occasional medium white mineral, occasional fine mica, common medium vegetal inclusions. Wet-smoothed on the exterior and interior.

e) L-831 ZT 28495/47
Painted body sherd. Medium fabric quality. 10 YR 7/4 very pale brown exterior surface with 2.5 YR 4/6 red painted decoration, 10 YR 7/4 very pale brown interior surface, paste, and core. Sparse fine black and white mineral, sparse fine mica, sparse fine vegetal inclusions. Wet-smoothed.

f) L-831 ZT 28471/21
Fine fabric quality. 7.5YR 7/6 reddish yellow exterior surface, with red (10R 3/4 dusky red, 10R 4/8 red, depending on the local thickness of paint) painted decoration, 7.5YR 7/6 reddish yellow interior surface, 10R 5/6 red paste and core. Occasional fine black mineral, sparse fine mica, occasional fine vegetal inclusions. Wet-smoothed on the exterior and interior.

g) L-831 ZT 28495/50
Medium fabric quality. 2.5 Y 8/2 pale yellow exterior surface with 2.5 YR 4/4 reddish brown paint, 2.5Y 8/2 interior surface, 7.5 YR 8/4 pink paste and core. Occasional fine black mineral, occasional fine mica, occasional fine vegetal inclusions. Wet-smoothed.

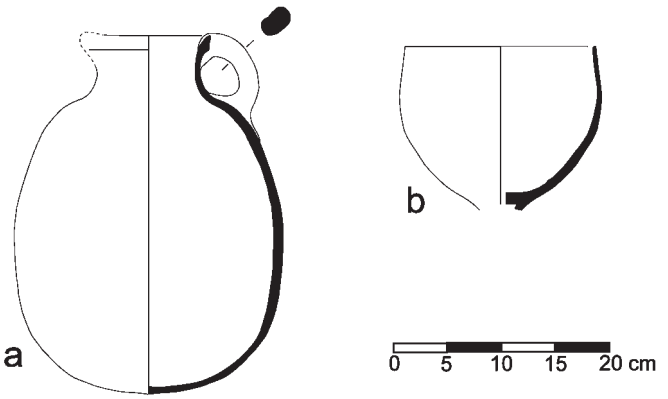


Fig. 19. Post-Assyrian pottery from R-077.

Fig. 19. Ceramic catalogue

a) R-077 ZT 30556

Trefoil jar with handle. Medium fabric quality. 5YR 5/6 yellowish red exterior surface, ashy interior surface, 5YR 5/4 reddish brown paste and core. Occasional fine black and white mineral, fine mica, and fine vegetal inclusions.

b) R-077 ZT 30555

Handmade deep bowl with foot missing. Medium fabric quality. 5YR 5/8 yellowish red (on the rim) and 5YR 5/6 yellowish red (on the body) exterior surface, 5YR 5/4 reddish brown paste and core. Occasional fine black and white mineral, occasional fine mica and vegetal inclusions. Burnished on the rim and on the visible exterior surface.

Fig. 20. Plan of architecture in Operation G/R showing Late Assyrian buildings. Shading represents the location of pebbled mosaic courtyards.

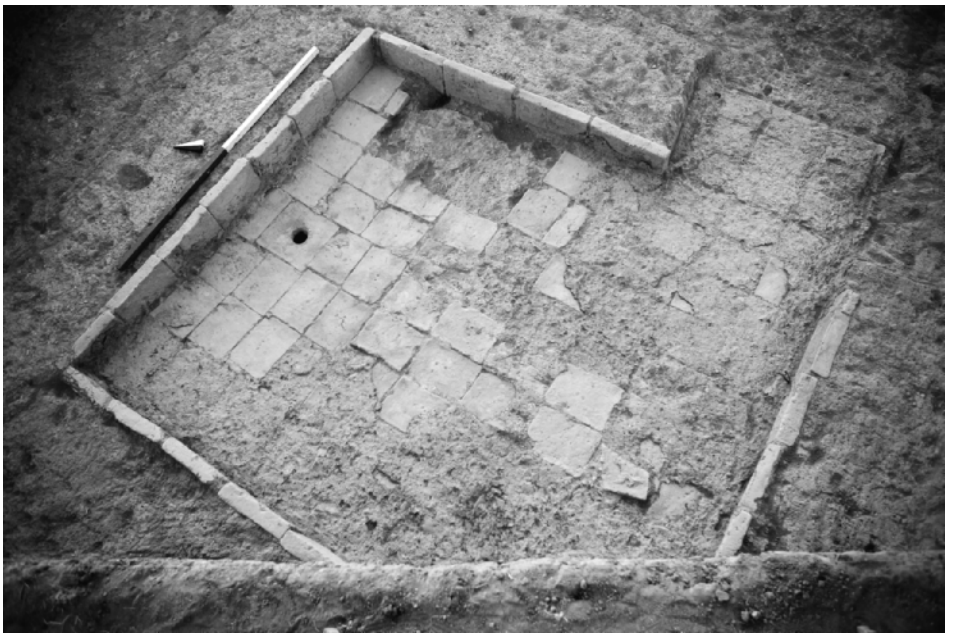


Fig. 21. Operation G/R. Building 2, Room 27.
Late Assyrian bathroom paved in baked bricks with drainage opening.

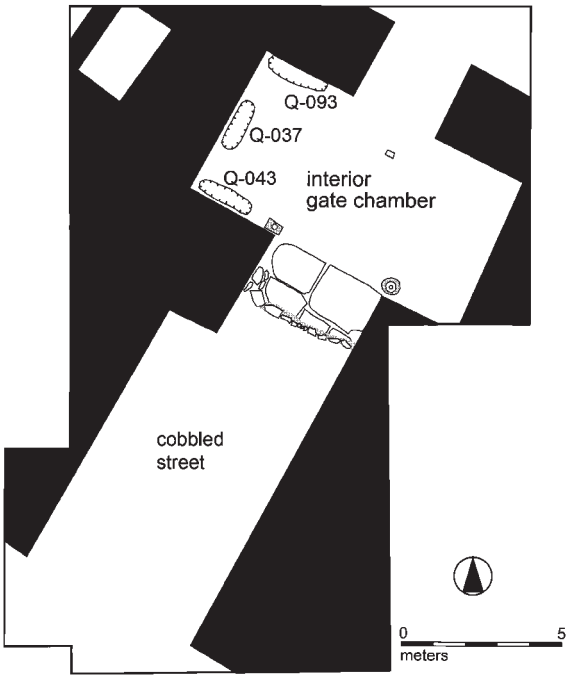


Fig. 22. Plan of the gateway in Operation Q showing the pebbled surface, interior gate chamber, and the location of the post-Late Assyrian graves. Phase 2 limestone slabs are seen near the center of the plan.

Fig. 23. Grave Q-043 with burial offerings *in situ*. Notice the placement of the right hand inside the vessel.

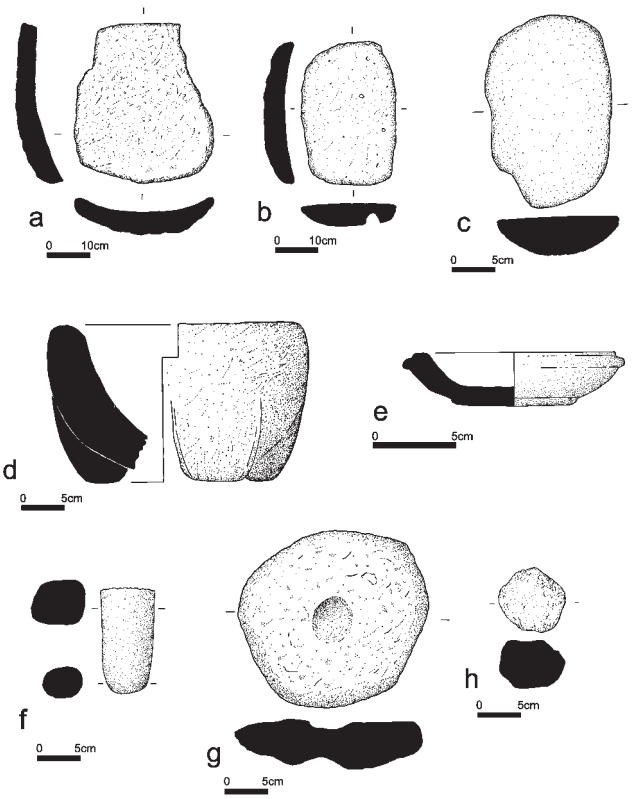


Fig. 24. Ground stone types from Ziyaret Tepe. Grinding stones (a: ZT16034, b: ZT19749), handstone (c: ZT6661), vessels (d: ZT20208, e: ZT29605), pestle (f: ZT3316), door socket (g: ZT22405) and pounder (h: ZT4422).

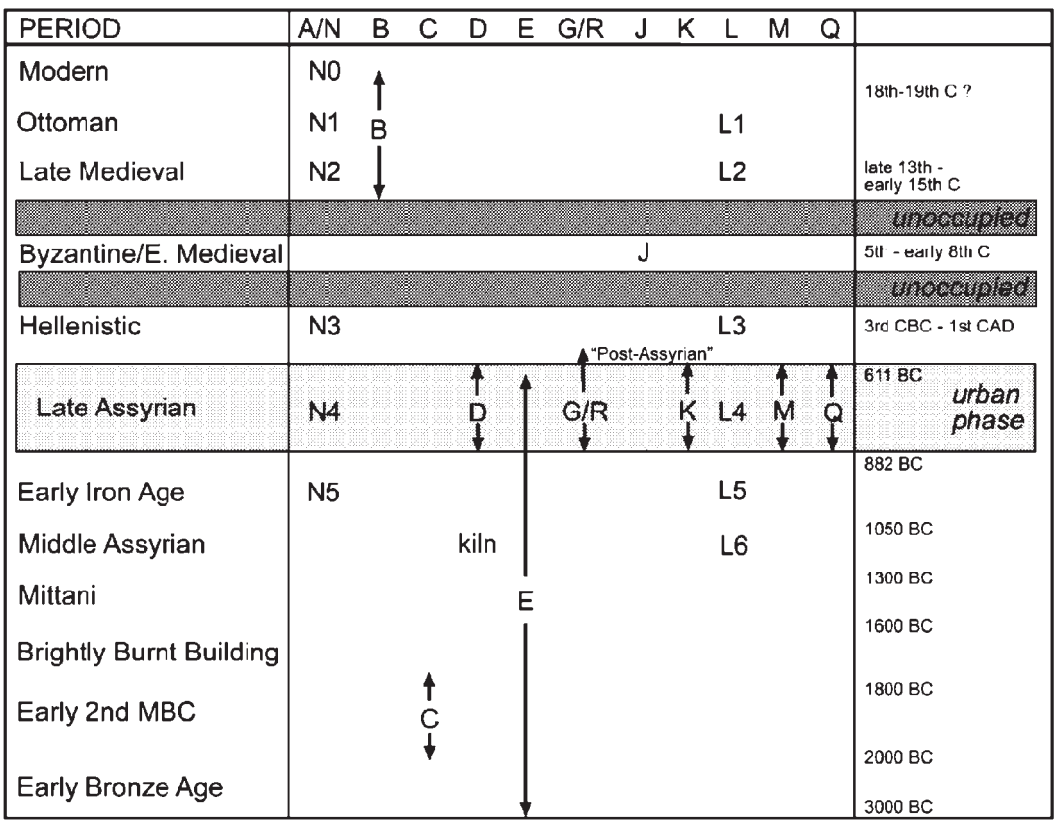


Fig. 25. Revised chronological chart showing the principal periods of occupation, representation of periods by excavated Operation, and approximate chronological dates.

ANATOLICA XXXV, 2009

THE UPPER TIGRIS ARCHAEOLOGICAL RESEARCH PROJECT (UTARP): A Preliminary Report from the 2007 and 2008 Field Seasons at Kenan Tepe

Bradley J. Parker, Catherine P. Foster, Kathleen Nicoll, Jason R. Kennedy, Philip Graham, Alexia Smith, David E. Hopwood, Marie Hopwood, Kristen Butler, Elizabeth Healey, M. Barış Uzel and Reilly Jensen [1]

INTRODUCTION

During the summers of 2007 and 2008, members of the Upper Tigris Archeological Research Project (UTARP) undertook an eighth and ninth season of fieldwork in the Upper Tigris River region of southeastern Turkey (figure 1).[2] The 2007 field season was aimed at completing the excavations of the Ubaid period domestic structures partially unearthed at Kenan Tepe in previous seasons. The 2008 field season was the first of three study seasons aimed at completing the analysis of our excavated material and preparing it for publication. The 2007 season, which was our last season of excavation, took place between June 1st and July 6th. Excavations concentrated on the

[1] This report is very much the product of teamwork. Bradley J. Parker researched and composed the introduction as well as the trench summaries of the 2007 excavations. He also compiled and edited this report. Bradley Parker and Reilly Jensen are responsible for the subsection on the Ubaid microdebris. The section on Ubaid ceramics is the work of Bradley Parker and Jason Kennedy. Catherine Foster researched and composed the subsection on the Late Chalcolithic microdebris and helped copy edit this report. Kathleen Nicoll researched and composed the section on the geomorphology of the area. She also helped copy edit this report. Philip Graham and Alexia Smith researched and composed the archaeobotanical remains. Elizabeth Healey is responsible for the lithics analysis. David Hopwood researched and composed the section on the burials. The section on small finds is the work of Marie Hopwood and Kristen Butler. M. Barış Uzel aided in the microdebris and ceramic sections. He was also instrumental in the project's success in the field.

[2] We would like to thank the Turkish Ministry of Culture and Tourism for granting us permission to conduct this research. We would also like to thank Mehmet Arif Bilici of the Diyarbakır Museum for his assistance to the project. This report is dedicated to Necdet İnal, the former director of the Diyarbakır Musuem, for his support and dedication to UTARP during the first decade of its existence. I would like to give my deepest thanks to our government representatives: Resul İbiş (aka: "the-best-rep-ever") in the 2007 season, and Suat Şahin (Resul's competition for the above title) during the 2008 field season. UTARP's 2007 field season was funded by a generous grant from the Curtiss T. and Mary G. Brennan Foundation to whom we owe our deepest thanks. The geomorphological research was supported by Royal Society (UK) and Brasenose College, University of Oxford. UTARP's 2007 team was made up of Bradley Parker (University of Utah), Catherine Foster (UC Berkeley), Lynn Dodd (University of Southern California), Jason Kennedy (SUNY Binghamton), Mila Hover (University of Utah), Liz Clark (University of Utah), M.M. Barış Uzel (Ege University), Jonathan Vidar (University of Southern California) and Kristen Butler (University of Southern California). The 2008 field season was again partially funded by the Curtiss T. and Mary G. Brennan Foundation. Funding was also obtained from the University of Southern California and the University of Utah. The 2008 team consisted of Bradley Parker (University of Utah), Catherine Foster (UC Berkeley), Lynn Dodd (University of Southern California), Marie Hopwood (SUNY Binghamton), David Hopwood (SUNY Binghamton), Jason Kennedy (SUNY Binghamton), Mila Hover (University of Utah), Ashley Sands (University of Southern California), Kristen Butler (University of Southern California), Jon Vidar (University of Southern California), and M. Barış Uzel (Ege University).

Ubaid period remains previously identified on the eastern slopes of Kenan Tepe's high mound (Parker, Creekmore and Dodd 2004; Parker and Dodd 2004; 2005; Parker *et al.*2006). This research revealed a number of important Ubaid period contexts including outdoor work areas belonging to our *Ubaid Phase 1* in trench D8, and an earlier phase of construction of our *Ubaid Structure 3* in trench E2 (figure 2). We also found evidence for the latest phase of Ubaid period occupation at Kenan Tepe (*Ubaid Phase 4*) in Trench D6. The highlight of the 2007 season was, however, the discovery of a well preserved Ubaid period burnt house (*Ubaid Phase 2/3*). This structure was characterized by a dense collapse layer and a large number of *in situ* artifacts and ecofacts. During the summer of 2008, members of the Upper Tigris Archaeological Research Project (UTARP) returned to southeastern Turkey to conduct a study season. The aim of the study season was to process and analyze all of the relevant data from Ubaid period contexts in preparation for a final report. The 2008 study season took place between June 1st and July 3rd. What follows is a preliminary assessment of this research.

GEOMORPHOLOGICAL SETTING

Kenan Tepe is a 4.5 hectare multi-period mound located in the Ilısu dam area on the north bank of the Tigris (Dicle) River approximately 15 kilometers west of the Tigris-Batman confluence in Diyarbakır Province, southeastern Turkey (figure 1). Situated high on the north bank of the Tigris River, Kenan Tepe affords a dramatic view of the surrounding countryside, which is characterized by a series of rolling hills (~ >600 masl[3]) that are interspersed with broad plateaus (510-530 masl). The archaeological site of Kenan Tepe is located on a natural outcrop of the Pliocene Şelmo Formation (ca. >~560 masl). This outcrop is a sedimentary unit made of interbedded conglomerates and siltstones (Jones and Racey 1994) that comprise much of the local landscape between the town of Bismil and the village Yapılar (figure 3).

Today this part of southeastern Turkey is arid to semi-arid with a dominance of rainfall events occurring during the winter (Türkeş *et al.* 2002). Infrequent westerly storms originating in the maritime domain contribute to low-magnitude discharge flow events from the headwater regions in the Taurus Mountains. Summer months are typically quite arid and are afforced by Mediterranean and continental climates with infrequent rainfall and occasional high-magnitude flashflood events. The local rainfall around the town of Bismil may exceed 600 Mean Annual Precipitation (MAP) in winter months, which sustains vegetation typical of the mountainous Mediterranean environment and steppe forest (Roberts and Wright 1993). Today the natural flora of the area has been perturbed in favor of agricultural cultigens, including cotton, sunflower, tobacco, potato, vegetables and melons within the river valley, all of which require intensive irrigation efforts.

[3] Meters above sea level.

Observations of the riverine setting from satellite imagery and aerial photographs as well as vehicular and pedestrian survey suggest that the modern Tigris is underfit. That is the level of water within the river valley floodplain is very low and the system is capable of carrying much more water. Today the river flow downstream of Diyarbakır is well below bankfull stage, owing to high rates of extraction for irrigation and animal husbandry. At some places, the diminished flow makes it possible to drive a vehicle across the channel, and cattle can be observed fording the stream especially during the summer months. In order to reconstruct the changing hydroclimatic conditions over late Quaternary timescales, field and laboratory investigations aimed at interpreting the records preserved within the Upper Tigris River valley were conducted over the past six seasons. Changes in baseflow, flood magnitude and frequency, and sediment transport can be discerned in the channel and floodplain morphology, and the sediments that form terraces along the river and its tributaries. To reconstruct the magnitude and timing of these changes, UTARP team members have mapped geological and archaeological units, are interpreting the local stratigraphic record and its proxy paleoenvironmental data (e.g. fossils such as pollen and charcoal) and are conducting associated geochronological determinations (e.g., radiocarbon and optical dates).

The modern Tigris floodplain downstream of Diyarbakır flows along a very curved path, creating meanders and wide scrollbars up to 1 kilometer in width as the river traverses the local bedrock (figure 4). The meandering stream system developed downstream of Bismil has sinuosities (the ratio of the channel length between two central points along a curving channel as compared to the straight-line distance between the same two points) measuring 1.2-1.7. Locally the river becomes more braided and anastomosing as a function of floodplain width, which is also influenced by the bedrock lithology.

As the Tigris approaches Kenan Tepe, the present river channel morphology incises gravel bars that were deposited when the river formerly flowed at higher stages, resulting in an anastomosing morphology within the meander belt of the stream (figure 3). Kenan Tepe presently overlooks a series of island channels and gravel bars to the southwest. These features probably did not exist during antiquity when the base flow of the river was higher and the river ran deeper. Hydroclimatic conditions contributing to a higher base flow in the past might include: enhanced precipitation (rainwater runoff and snow melt for example), lower evaporation rates, increased spring discharge from the river source, and enhanced input from tributary streams feeding the river. Kenan Tepe overlooks a wide portion of the modern floodplain (figure 3) to the southeast, where a broad sequence of low relief meander scroll bars have formed a broad plain called the Osman Mercalı. Gravel point bars are developed along the bank opposite of Kenan Tepe. Laterally these gravel point bars grade into sandy and silt facies, which may reflect waning flow stages associated with diminishing baseflows.

Geomorphic relationships near Kenan Tepe suggest that the channel position has remained relatively stable and in its present position since the Chalcolithic period. However, the river has incised its floodplain locally on the order of approximately ~5-10 meters, creating steep relief along its northern bank. There is active erosion of the river banks near Kenan Tepe and sediments have been removed from contexts associated with

the site's lower town at elevations approximately 20-25 meters above the modern river level. The degree of erosion affecting Kenan Tepe is a direct function of its location on the cutbank side of the meander loop. This reach of the stream is an area of high energy, where the river water runs deep and is channelized as it flows past the north bank and focuses on eroding steep banks through progressive undercutting and sapping.

The degree of incision (or vertical downcutting) apparent at Kenan Tepe can be linked to tectonic uplift being experienced in this part of Turkey (which is formally known as the Diyarbakır-Siirt Plateau [Görür and Tüysüz, 2001]), and is bounded by the SE Taurus Mountain belt. The uplift of the Taurus-Zagros mountain belt across Syria, Turkey and Iran, which commenced around 12 million years ago and continues today, has resulted from the collision of the Arabian and Eurasian plates, (Dewey et al., 1973, 1986; Sengör and Yilmaz, 1981; Reilinger et al., 1997). Progressive uplift along this plate tectonic collision zone and folding of the local bedrock strata is apparent in the local hillside exposures along the north bank of the Tigris near Kenan Tepe. The Tigris River has adjusted to the developing topographic relief by incising (or vertical downcutting) bedrock units that are easily eroded; high rates of incision are especially apparent in the reach past Kenan Tepe, and near Batman, where the river has carved the limestone into impressive vertical bluffs.

EXCAVATION SUMMARIES

Area D Trench 4

Trench D4 has been an important excavation unit throughout our excavations at Kenan Tepe. In our previous reports (Parker *et al.* 2003; Parker and Dodd 2003) we highlighted the second millennium remains excavated in this trench. One of the main goals of the 2007 field season was to excavate this and the neighboring trench D6 down to the Ubaid strata that we knew existed there from our excavations in trenches D5 and D8. This was a difficult task since the two trenches in question lie uphill from the units that have previously produced Ubaid material and thus there was a significant amount of later material overlying the Ubaid levels in this trench. Two things helped us overcome this difficulty. First, almost a meter of the overlaying contexts consisted of multiple layers of the same second millennium pebble streets that we have excavated in previous seasons (Parker *et al.* 2003:112-113; Parker and Dodd 2003:37-39). Since this street ran the length of both of these 6 by 10 meter units, our 2005 excavations in trench D6 gave us a relatively clear idea of what to expect in trench D4. Second, it is now clear that these second millennium contexts lie directly above the Ubaid contexts on this part of the site. This stratigraphic relationship obviously has important implications. It suggests that significant erosion episodes must have occurred before the construction of the second millennium street and that this erosion must have removed later overburden, thus allowing the construction of second millennium architecture directly on the much earlier Ubaid levels. These data correlate well with observations made in trench D5 during previous field seasons (Parker *et al.* 2006:77-79). Given the straightforward stratigraphy

in this area, UTARP team members were able to move relatively quickly through the second millennium remains without sacrificing the accuracy and attention to detail that have become the trademark of the UTARP project.

Once the second millennium streets were removed excavations in trench D4 reached a fill layer that, upon examination, proved to contain exclusively Ubaid ceramics. Directly below this fill we encountered an outdoor surface belonging to Kenan Tepe's *Ubaid Phase 4*. This stratum was characterized by flat lying potsherds, ground stone artifacts and the pseudomorphic remains of organic materials. Below this *Ubaid Phase 4* surface we encountered an ash layer that extended over an area larger than 5 by 6 meters. Later research revealed that this collapse was the result of a conflagration that destroyed a domestic structure that was partially contained within trenches D4 and D6 (hereafter referred to as *Ubaid Structure 4*). For greater stratigraphic control we divided this large collapse layer into several horizontal and vertical loci during excavation. The upper most layers contained a large amount of baked mud debris that we believe to be clay architectural fragments that were preserved due to the heat of the fire that caused the collapse. These architectural fragments included two types of mud slabs. The first is relatively large (as much as 30 by 20 centimeters and more than 20 centimeters in thickness). These artifacts are smooth on one side and have deep reed impressions on the other (figure 5). The second type of architectural fragment consisted of much smaller semicircular crescent-shaped mud artifacts. The upper portion of this collapse was also characterized by large amounts of burnt reeds. Our interpretation of these artifacts is that they represent the burnt remains of the roof of *Ubaid Structure 4*. Other interesting remains contained in the upper levels of the collapse of *Ubaid Structure 4* include what we interpret to be unfired clay vessels that, like the architectural remains just described, were only preserved because of the fire that destroyed the structure. The vessels represented in this corpus are very different from the fired ceramic material in that most of the fragments recovered are the remains of large basins or tubs. Finally, this and the succeeding layer of collapse contained copious amounts of charred grain often associated with burnt organic material that is likely the remains of grass or reed baskets (see below). We suggest that both baskets and unfired clay basins or tubs represent part of the assemblage of artifacts stored or utilized on the roof of *Ubaid Structure 4*.

The character of the collapse layer changed once we removed the roof debris. This strata, which was located directly above and upon the floor of *Ubaid Structure 4*, contained numerous complete, or nearly complete crushed vessels (several of which were filled with grain), a number of concentrations of carbonized seeds, animal bones, river mollusk shells, lithic tools, several spindle whorls, ground stone tools, a whet stone, two andirons and an enigmatic clay cone.[4] The southwest portion of the floor of *Ubaid Structure 4* was covered by a grass mat similar to the one excavated in trench D5 during previous seasons (Parker *et al.* 2005:72). Further excavation revealed that the collapse layer was concentrated in the central room of a large domestic structure. The central room

[4] A number of these finds as described below. A full accounting of the finds and their contexts will be included in the final publication of these data.

of this structure (the northern portions of which was located in trench D4, but the southern end of which extended into trench D6) measured approximately 7 by 3 meters and was oriented roughly north-south (figures 6, 7 and 8). This room was flanked on the east and north by several smaller rooms measuring approximately 1.5 by 3 meters. Access to these rooms was through crawl spaces resembling low windows (figure 7).

Area D Trench 6

The excavation of trench D6 closely followed the excavation of trench D4. Since the second millennium street described elsewhere traversed both trenches, we were able to remove these remains relatively quickly while still maintaining tight control of the excavation. The first Ubaid remains discovered belonged to the very end of Kenan Tepe's Ubaid sequence (*Ubaid Phase 4,* [probably terminal Ubaid or LC1 ca. 4400-4200 BCE]). These remains were characterized by the well-known flint-scraped "Coba bowls," two infant burials (see below), a number of disarticulated architectural remains and three hearths. One of the infants appears to have been interred in an unfired clay vessel and the other in a basket. Both were sunk into what appear to have been outdoor work surfaces. The hearths were composed of compacted silt with pebbles overlying cobbles and dense concentrations of lithic tools, cores and debitage.

Directly below the *Ubaid Phase 4* remains UTARP team members uncovered the southern end of *Ubaid Structure 4* discussed above. These remains consisted of the southern end of the large central room of *Ubaid Structure 4* and part of a smaller side room on its east side. A threshold allowed entrance into this small room from the outside and from there, access to the larger central room (figure 8). Like trench D4, the remains in the central room were characterized by a deep collapse layer consisting first of a number of architectural fragments such as those described above, copious amounts of ash and concentrations of burnt seeds that undoubtedly fell from the roof of *Ubaid Structure 4* when it was destroyed by fire. Numerous small finds were discovered on the floor of this structure. These included numerous loom weights, bone awls, three small axe heads, jewelry and several andirons (see below).

Summary of Ubaid Structure 4

Ubaid Structure 4 consists of a large central room almost completely contained within trench D4 and the northern portion of trench D6 (figures 6, 7 and 8). This room measured approximately 7 by 3 meters. The central room was flanked on the east by two long narrow rooms measuring approximately 1.5 by 4 and 1.8 by 2.2 meters respectfully. Similar rooms likely existed on the west although only a small portion of a northeastern room was contained in the northwestern corner of trench D4. This room was most likely used for storage since it contained a medium sized vessel sunk into the floor. The northern end of the central room was also flanked by a long room slightly off-set in orientation from the rest of the structure. The entrance to *Ubaid Structure 4* was located in the southern end of the long room on the southeastern corner of the building. A threshold connected this to the large central room. South of *Ubaid Structure 4* in a large portion of trench D6 UTARP team members excavated a number of outdoor work

surfaces and portions of two fireplaces. These surfaces were bordered on the east by a thick row of stones that acted as a retaining wall between the surfaces in trench D6 and the slightly lower but nevertheless associated storage rooms in trenches D8 and D10.

During the last 10 days of the excavation we removed the baulk separating the up-hill trenches (D4 and D6) from the down-hill trenches (D5 and D8). Not only did this broaden our exposure but once we removed the baulk it became clear that one of the walls of the burnt house connected this structure with the cell structures excavated in trenches D8 and D5 in previous seasons (Parker *et al.* 2008106-108; 2005:71-72). We can thus conclude that the remains excavated in all four of these trenches represent a single architectural unit stretching across a 12 by 20 meter area.

Area D Trench 8

Trench D8 is a 6 by 10 meter excavation unit located on the eastern slopes of Kenan Tepe's high mound (figure 2). In previous seasons, excavations carried out in trench D8 revealed two superimposed Ubaid period cell-plan structures dating to ca. 4600 BCE (Parker 2007). Although the contexts around these structures were excavated during our 2005 field season, for reasons that were beyond our control, parts of the walls of the earliest cell-plan structure (*Ubaid Phase 2*) remained in that trench at the beginning of the 2007 field season. The goal of excavations in this trench was therefore, to remove the remains of this structure (referred to in our previous reports as *Ubaid Phase 2, Structure 1*) to reach any earlier remains that may lie buried underneath.

We began the season by clearing the debris that had accumulated during the off season and carefully removing our backfill and the plastic tarps we had laid down to protect the *Ubaid Phase 2* contexts remaining in this trench. We then carefully sampled the remaining contexts. The two contexts left from the previous season were surfaces within the northern larger rooms belonging to *Ubaid Structure 1* (Parker *et al.* 2008: fig. 8). Excavation revealed that these two rooms contained reed and grain pseudomorphs, some ceramics and lithics. These data suggests that these rooms were likely used for food processing and storage. Microdebris samples taken from these rooms are currently being analyzed in the Microarchaeology Lab at University of Utah.

Once *Ubaid Structure 1* was completely removed we reached a number of superimposed occupation levels dating to Kenan Tepe's earliest period of occupation (*Ubaid Phase 1*). These remains included a small architectural unit consisting of walls protruding into the trench from its northeastern corner to encompass an area of approximately 1.5 by 1.5 meters (hereafter referred to as *Ubaid Structure 5*). The remainder of this structure is likely contained in the eastern and northern baulks and may have originally stretched into the neighboring trench D9 where it would have been removed either by erosion and/or during the construction of the Late Chalcolithic oven discussed in Parker *et al.* 2005. This small structure was associated with an outdoor work surface that yielded a number of domestic artifacts including ground stone tools, ceramics, lithics, animal bone and shell.

The character of this area changed considerably once the remains of *Ubaid Structure 5* were removed. Directly beneath this feature we came upon a large oven or kiln and a number of associated outdoor surfaces. The oven or kiln, which measured approximately 1.5 meters in diameter, was constructed of mud brick that had become vitrified through repeated high temperature firing. This feature was obviously used repeatedly as the surrounding matrix was heavily burnt and the oven had eventually collapsed in on itself. The outside work surfaces adjacent to this oven/kiln were characterized by painted fine and unpainted coarse Ubaid ceramics, animal bone and a large number of ground stone implements. These remains are well paralleled by our 2005 excavations by what we believe to be contemporary outdoor work surfaces in the neighboring trench D5. An infant burial was also discovered within these strata. This infant (described below) was interred in a shallow pit that was lined with a textile or straw mat.

In addition to the features and artifacts briefly described above, the major importance of the 2007 excavations in trench D8 is that this research greatly increased our sample of materials from the earliest phase of Ubaid occupation at Kenan Tepe (*Ubaid Phase 1*). The small structure (*Ubaid Structure 5*) is the only architectural unit dating to this phase thus far discovered. The remains of this structure constitute part of what was probably a very modest domestic building, portions of which may have been eroded from the eastern edge of the trench, or were destroyed during the construction of later Late Chalcolithic ovens in trench D9. Although our *Ubaid Phase 1* exposure is too small to be conclusive, the data support the hypothesis that domestic structures dating to this earliest phase of occupation at Kenan Tepe were considerably more modest than those of Kenan Tepe's *Ubaid Phase 2* and *Ubaid Phase 3*. These data also suggest that other structures dating to this period are either buried deep within the high mound or were constructed of organic materials. Further, features such as the storage pits, the oven/kiln discussed above, or the hearths excavated previously in trench D5 (Parker *et al.* 2008), suggest that even in this earliest documented phase, the region's Ubaid period inhabitants led a sedentary, or at least semi-sedentary, lifestyle. Although the botanical and faunal remains from *Ubaid Phase 1* contexts in trench D8 have yet to be processed, the presence of large numbers of ground stone tools, along with several storage bins, suggest that Kenan Tepe's earliest Ubaid inhabitants were at least partially dependent on grain cultivation for subsistence (see below).

Area E Trench 2

Trench E2 is a 7 by 7 meter excavation unit located on the southeastern slopes of Kenan Tepe's high mound (figure 2). In previous seasons this trench produced part of an Ubaid period cell-plan structure referred to in our previous reports as *Ubaid Structure 3* (Parker *et al*. 2008). These remains belong either to *Ubaid Phase 2/3* or *Ubaid phase 4*.[5]

[5] Because of the proximity of carbon dates from the various phases of the Ubaid period at Kenan Tepe and because there is no direct stratigraphic connection between trench E2 and our excavations in Area D, we are not yet sure where *Ubaid Structure 3* belongs in the Ubaid sequence at Kenan Tepe. Ceramic and architectural parallels suggest it should fit either in our *Ubaid Phase 2/3* or *Ubaid Phase 4*.

Excavation in trench E2 during the 2007 field season revealed that *Ubaid Structure 3* was rebuilt three times. Associated with these earlier construction phases were a number of well preserved surfaces that yielded excellent samples of obsidian lithics, Ubaid fine ware ceramics and animal bones. Microarchaeological samples of these surfaces were also taken using the Household Archaeology Protocol (HAP) sampling methodology (see below). Although following the same plan, the walls of the two earlier phases of construction consisted of only one or two rows of mud bricks and in the final phase the exterior wall of *Ubaid Structure 3* consisted of four rows of bricks. A number of well preserved surfaces were discovered abutting these earlier constructions. In addition, a foundation burial was discovered directly between the second and the third phase of construction (see below).

Excavations in trench E2 were significant for several reasons. First, the recovered materials substantially increased our sample sizes of various artifact categories that are allowing a comparison of multiple overlaying surfaces. Second, this research showed that *Ubaid Structure 3* was created over what was probably a number of generations. Third, the presence of a third human burial *within* Ubaid architectural units suggests a pattern of ritual inhumation during the Ubaid period (see below).[6]

MICROARCHAEOLOGICAL ANALYSES

Since 2004, UTARP team members have engaged in a site-wide program of microarchaeological sampling as a complement to traditional excavation and specialist analyses of botanical, faunal, lithic, stone and biological remains. This program has focused on the examination of microdebris, though future UTARP projects will undoubtedly include other facets of microarchaeology, namely soil chemical analysis, micromorphology and microstratigraphy. The application of microdebris collection techniques and analysis (discussed below) is part of a broader research agenda at Kenan Tepe to elucidate the nature of domestic economies, use of space, and the general development of households as a reflection of larger socio-cultural changes during the Ubaid (ca. 4650-4100 BCE) and Late Chalcolithic (ca. 3600-3000 BCE) periods both in the Upper Tigris River valley and greater Mesopotamia.

Microdebris analysis, also known as micro-refuse or heavy-residue analysis, is the examination of minute pieces of stone, bone, ceramics and other artifacts that have become embedded within the sediment matrix of archaeological loci. These microartifacts range in size from 90 to 0.25 millimeters depending on the researcher and are preserved and subsequently recovered whole or in various stages of fragmentation. At Kenan Tepe, microartifacts are classified as any cultural object less than 1 centimeter, but greater than 1 millimeter, in size. Microartifacts enter the archaeological record through trampling, loss, lack of detection during cleaning episodes, or through subtractive technologies like flint knapping. Due to their small size, microartifacts are less affected by the natural and

[6] Two similar burials were discovered during the 2005 field season (Parker *et al*. 2008).

cultural formation processes of the archaeological record that determine the presence, patterning, and preservation of other traditional artifacts. Because of this, microartifacts are usually considered primary refuse (Schiffer 1987) resulting from an activity, practice or behavior that is recoverable archaeologically. Microdebris analysis has been carried out at a number of ancient Near Eastern sites (Rosen 1989, 1991; Rainville 2005 and in Matney *et al*. 2007; Özbal *et al*. 2004; Cessford 2005) and has been shown to effectively highlight primary use contexts and the spatial distribution of activity zones as they relate to macroartifact distributions.[7]

Methodology

The microarchaeological sampling procedure at Kenan Tepe is known as the Household Archaeology Protocol (hereafter "HAP"). Sediment samples are judgmentally collected from a variety of contexts including interior surfaces (floors, 'work surfaces'), exterior surfaces (streets, alleyways), and other features such as ovens, hearths, kilns, storage bins. First, a 50 by 50 centimeter square is sectioned off then excavated down to the base of the feature, for example the depth of the floor not including the subfloor. The sediment obtained from these HAP samples is not screened, but collected *in toto* while the rest of the preserved feature is excavated, measured in marked buckets to record the total volume of the locus, and screened at a 1 to 1 ratio. A second regular flotation sample is also collected to supplement the primary HAP.

While the majority of features where microdebris samples were taken using the HAP procedure are surfaces, flotation samples were also collected from ovens, hearths, pits and middens. Though not collected using the protocol, the heavy fractions from these samples were processed and analyzed the same way as HAP samples (see below). Mud bricks were also sampled in order to record the elements from which they were comprised. These particular data are important because the breakdown of mud brick, whether through destruction or decay over time, introduces elements like shell or lithic fragments into the archaeological record, thus adding extra secondary refuse that would not be evidence for primary activity (Rosen 1989, Rainville 2005). In total, 494 HAP and flotation samples have been collected with a combined volume of 1,794 liters. To date 85 samples have been sorted. The average sample size is 3.63 liters.

Botanical and microartifacts were recovered from the HAP samples through a flotation process using a standard Siraf-type flotation machine (Williams 1973) that incorporated an internal grid plate (Nesbitt 1995). Sample volumes were first determined and recorded, then the sediment was introduced into the water-filled tank lined with a 1 millimeter mesh and outfitted with side screens. Once the water was agitated, charred seeds and charcoal ("light fraction" or flot) were siphoned into a side trough and collected in sieves lined with 1 mm and 0.25 millimeter meshes. The remaining material inside the

[7] The results of this relatively new and unstandardized method of microdebris analysis, however, is not without controversy (see Cessford 2003). In general, the degree and amount of microartifacts that are present and recoverable within any context/locus depends on several factors: cultural use of the space, the types and condition of objects that were utilized in the space, and the permeability of the soil matrix that makes up the surface or feature.

tank ("heavy fraction" or residue) containing the microartifacts themselves was then thoroughly cleaned and dried. Due to time and labor constraints in the field, we exported the light and heavy fractions to the Microarchaeology Laboratories at the University of Utah and the University of California, Berkeley for further processing.

In the laboratory, the heavy fractions were each weighed and sifted through a set of geologic sieves to subdivided the sample into size fractions of greater than 5.6, 4, 2, and 1 millimeter. Objects that were larger than 10 millimeters/1 centimeter were hand-sorted from the greater than 5.6 millimeter screen by visual inspection with the aid of a ruler and classified as "macroartifact." Then each size fraction was sorted using 2.0x Optivisor® binocular magnifiers and a Leica® EZ4 stereomicroscope (8× - 35×; 10× eye piece). The microartifacts were separated from rocks, sticks, dirt clods and other non-cultural debris into broad material categories: ceramics, lithics, shell, animal bone, grindstone, seeds, charcoal, and "other." Some of these categories were further subdivided such as ceramics into fine, medium and coarse fabrics. These subdivisions are not arbitrary, but based on the macroartifacts that have been excavated and analyzed at Kenan Tepe from Ubaid and Late Chalcolithic contexts. With these data, the count and weight densities of each object category are calculated by dividing the count or weight measured in grams by the total volume of the HAP or flotation sample expressed in liters. These count and weight densities for microartifact types allow for standardization and comparison between samples despite uneven sample volumes.

Microartifact Categorization and Meaning

Our analysis of microartifact data relies on the results of a number of studies conducted on microartifact creation, deposition and preservation (Dunnell and Stein 1989, Fladmark 1982, Hull 1987, Metcalfe and Heath 1990). These studies underlie our interpretations of what activities might have led to the existence and densities of each of the material categories. Despite the work by these studies, we are bound by certain limitations when using microartifacts as a dataset.Microbone, for example, can only rarely be identified to the species level due to size and high fragmentation. In some cases the data allow us to distinguish the remains of small animals such as birds, rodents or fish but the vast majority of the bones recovered are likely the comminuted remains of large animals. Although there are obviously a variety of ways that bone can become deposited in the archaeological record, we contend that a large portion of the bone found in the soil matrices of floors represent the residue of meat processing or consumption. Tiny fragments of bones belonging to large animals are not likely to have been deposited in domestic contexts without human agency. One possibility is that these bones were contained in soil in the building or rebuilding of mud brick structures or in the paving or repaving of mud surfaces. Another possibility is, of course, that bone accumulated on a surface during butchering, cooking or eating.

Some small animals such as rodents or birds could have been deposited in domestic spaces without the aid of humans. Small animals could have died or been killed on or near a surface. If their remains were never removed, their bones could have found their way into the matrices of domestic surfaces. It is also possible that small animals

were butchered and eaten on these surfaces. In either case, the remains of small animals like rodents or birds represent a tiny portion of the total bone remains recovered in the microsamples. The interpretation of fish remains is more clear-cut. Although it is possible that fish bones could have been present in sedimentary deposits used in the construction of domestic spaces, the fragility of fish bones makes it unlikely that they would survive intact. We assume, therefore, that bones that are intact enough to be identified as fish almost certainly represent the residue of fish processing or consumption.

We interpret the remains of obsidian and chert to be the result of the manufacture, modification or use of lithic tools. Although chert can appear naturally in soils, unprocessed chert is smooth and rounded resembling pebbles or rocks. In most cases chert remains recovered from microsamples are sharp and angular suggesting intentional modification by humans. In the case of obsidian, which does not occur locally, there is no doubt that remains of this material category represent the residue of the manufacture, modification or use of obsidian tools.

Ceramic microdebris is both the most difficult to identify and the most difficult to interpret of these three categories. Since, like ceramics, the matrices of ancient surfaces are made up of clay, we used very strict criteria for distinguishing ceramic debris from the surrounding matrix. To be included in this material category ceramic microdebris had to be connected to the surface of a ceramic vessel, evidenced at the micro level by at least one flat, smooth edge. We realize that this methodology means that we almost certainly under counted the ceramic microdebris. However, we felt that it was imperative for us to maintain a uniform methodology to ensure the compatibility of various datasets. In spite of the fact that there are many ways in which ceramic microdebris might find its way in to the matrices of surfaces, we contend that concentrations of ceramic microdebris represent the residue from habitual use of ceramic vessels on or near the examined contexts.

Preliminary Results from Ubaid Period Contexts

During the 2005 and 2007 field seasons UTARP team members collected seven HAP samples from superimposed strata in trench E2 (figure 2). Five of these samples were taken from a series of outside work surfaces directly connected to the *Ubaid Structure 3* described above and in Parker *et al*. 2008.[8] These samples thus represent a number of subphases in the use-life of that structure. The surfaces from which these samples originate took up a large portion of the northeastern half of the trench. They were characterized by fine grayish soil containing a high density of artifacts and ecofacts. The five Ubaid period HAP samples are followed by two more HAP samples that come from Late Chalcolithic (LC 1) strata directly above *Ubaid Structure 3*.[9] These samples were collected from an alleyway or outside work surface associated with two walls. The

[8] In chronological order from oldest to youngest these samples are E.2.169.4, E.2.168.1, E.2.164.1, E.2.126.1 and E.2.97.1.

[9] In chronological order from oldest to youngest these samples are E.2.83.1 and E.2.51.1.

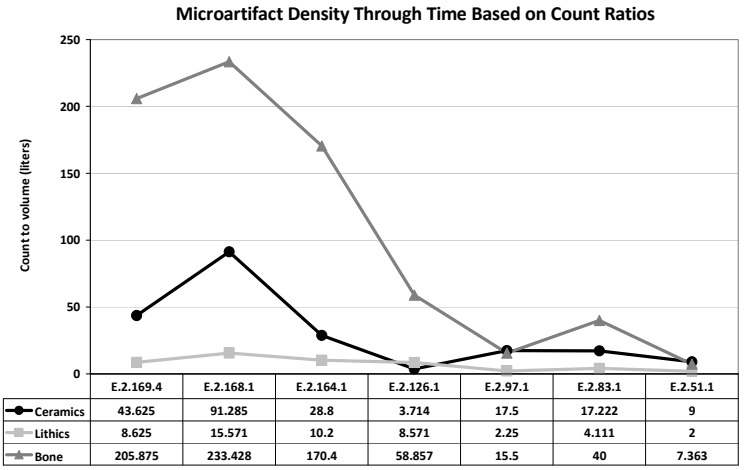
surrounding contexts were characterized by a low density of pebbles and occasional ceramics.

The currently available data do not allow us to precisely define the chronological range of these samples, nor are we able to estimate the time depth between specific samples. In spite of this, the data do allow a broad correlation for the beginning and end dates of this sequence. The overwhelming similarity between the earliest ceramics from trench E2 and ceramics associated with *Ubaid Phase 2/3* in Area D suggest a beginning date for this sequence in the latter half of the fifth millennium BCE. The latest of the Ubaid samples were associated with flint scraped "Coba bowls" suggesting that the end of the Ubaid sequence in this trench lies at the end of the fifth millennium BCE. Ceramic parallels also suggest an end date for the last Late Chalcolithic sample from trench E2 somewhere in the first half of the fourth millennium BCE. Although the Ubaid period and the Late Chalcolithic period samples are stratigraphically contiguous, it is likely that there is considerable time represented between the latest Ubaid sample and the earliest Late Chalcolithic sample. Although we lack absolute dates for the samples analyzed here, the relative dating of these samples allow for an interesting microarchaeological window on diachronic change. The purpose of this subsection is, therefore, to examine diachronic variation in microartifacts and to pose hypotheses about variation in domestic production and the use of space through time.

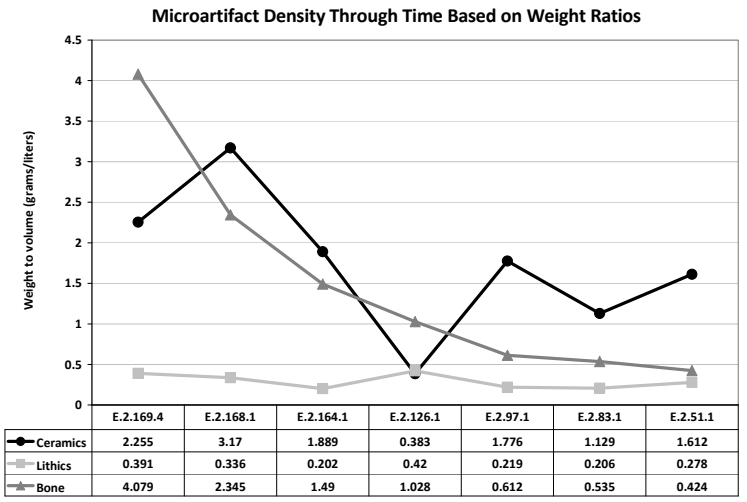
Graph 1 displays the fluctuations of the main material categories discovered in the dataset. These categories are: bone, lithics (including obsidian) and ceramics. These data attest to a distinct downward trend in the amount of bone per liter through time. Our interpretation of these data is twofold. First, the high densities of bone per liter in the earliest three samples (E.2.169.4, E.2.168.1, and E.2.164.1) suggest that this space was a locus of repeated activities that produced bone microdebris, such as butchering, cooking and/or meat consumption. This hypothesis is supported by the presence of numerous examples of bone microdebris that can be identified as large mammals and fish. Second, the marked decrease in the counts and weights per liter suggests that the use of this space changed through time. After the earliest three samples, the counts and weights trend toward relatively low amounts until the end of the sequence when these numbers are negligible. This suggests that activities such as butchering, cooking and meat consumption in this area decreased toward the end of the Ubaid sequence and then ceased during the Late Chalcolithic.

Counts and weight densities of bivalve shell belonging to a locally available riverine mollusk reveal an opposite trend. Table 1 shows that these numbers increase sharply from the first to the fourth sample. Bivalve count and weight densities decrease again at the end of the sequence. These data support the hypothesis that the exploitation of meat gave way to the exploitation of mollusks in this area during the Ubaid period. The data also suggest that riverine resources were less commonly exploited during the Late Chalcolithic.

Trends in the ceramic data parallel those in bone data. Although these trends are not as stark as they are in the bone data, there is a clear decrease in the overall count and weight densities of ceramic microdebris through time. Again, high densities in the earliest



	E.2.169.4	E.2.168.1	E.2.164.1	E.2.126.1	E.2.97.1	E.2.83.1	E.2.51.1
Ceramics	43.625	91.285	28.8	3.714	17.5	17.222	9
Lithics	8.625	15.571	10.2	8.571	2.25	4.111	2
Bone	205.875	233.428	170.4	58.857	15.5	40	7.363



	E.2.169.4	E.2.168.1	E.2.164.1	E.2.126.1	E.2.97.1	E.2.83.1	E.2.51.1
Ceramics	2.255	3.17	1.889	0.383	1.776	1.129	1.612
Lithics	0.391	0.336	0.202	0.42	0.219	0.206	0.278
Bone	4.079	2.345	1.49	1.028	0.612	0.535	0.424

Graph 1. Material densities based on count and weight ratios per liter from samples in trench E2.

three samples suggest that considerable activity involving the use of ceramics took place on these surfaces during the earlier part of our Ubaid sequence. The data are even more indicative when we divide the ceramic samples into fabric types (fine, medium and coarse fabrics [table 1]). Fine fabrics, which are abundant in the first two samples (E.2.169.4 and E.2.168.1), begin to drop off in the third sample (E.2.164.1) and disappear almost completely in the latest four samples (E.2.126.1, E.2.97.1, E.2.83.1 and E.2.51.1). This observation may be partially explained by the fact that the last two samples (E.2.83.1 and E.2.51.1) date to the Late Chalcolithic period and thus we would expect the fabric types

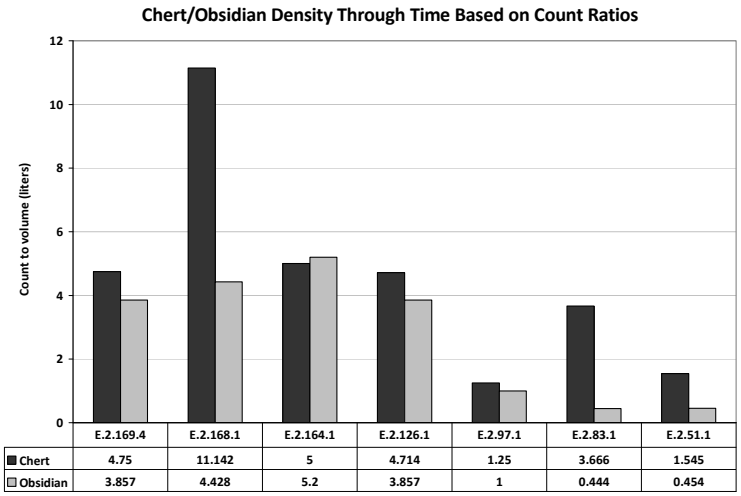
to be considerably different from those prevalent in the Ubaid period. In spite of this, the samples in the middle of the sequence suggest that this trend began in the Ubaid period. A similar decrease is evident in the medium and rough fabric densities (table 1).

Although it is difficult to assign function to ceramics based on fabric type, one assumption that we can make is that fine wares were not used for cooking – the macro ceramic data show that cookpots are always composed of rough fabrics (see below and Parker *et al.* 2006:86). Vessels made of Ubaid fine fabrics are usually small often open forms that are likely to have been used for serving (see below). With these observations in mind we hypothesize that a number of activities involving the use of ceramics, including food consumption (using vessels made of fine fabrics) and cooking (using vessels made of coarse fabrics), took place in this space at the beginning of our sequence. Such activities apparently shifted away from this space during and after the third sample in our sequence (E.2.164.1). The fifth sample (E.2.97.1.1) marks the beginning of an increase in the densities of medium and coarse fabrics. Although the medium fabric densities are not consistent, there is a clear trend toward increased amounts of coarse ware in the final three samples in our sequence (E.2.97.1, E.2.83.1, E.2.51.1) suggesting that this space again became the locus of food production.

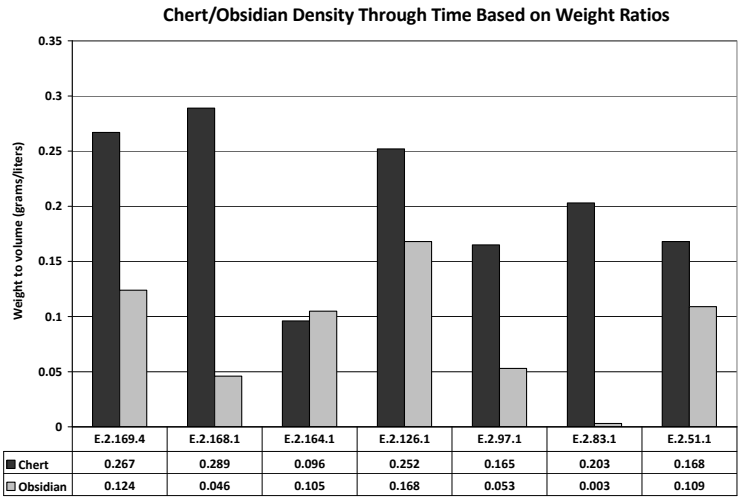
Sample Number	Fine Fabric Count Density	Fine Fabric Weight Density	Medium Fabric Count Density	Medium Fabric Weight Density	Coarse Fabric Count Density	Coarse Fabric Weight Density	Bivalve Count Density	Bivalve Weight Density
E.2.169.4.1	29.25	0.0431	9.875	1.091	4.5	0.733	0.5	0.004
E.2.168.1.1	43	0.442	35.142	1.714	13.142	1.013	0.285	0.016
E.2.164.1.1	17.8	0.223	6.8	0.447	2.2	0.155	1.8	0.059
E.2.126.1.1	0.571	0.036	1.714	0.164	1.428	0.182	2	0.04
E.2.97.1.1	0	0	12.375	1.207	5.125	0.569	0.5	0.051
E.2.83.1.1	0	0	1	0.089	16.222	1.039	0.444	0.014
E.2.51.1.1	0.909	0.062	2.454	0.566	5.656	0.982	0.727	0.021

Table 1. Densities based on count and weight ratios per liter from samples in trench E2.

In comparison with the bone and ceramic data, the densities of lithic microdebris are relatively consistent throughout the sample sequence. Although there is a slight decrease in the overall counts and weights of lithic debitage through time, the data suggest a relatively consistent use of this space for activities involving the production, modification and/or use of lithics. Graph 2 exhibits the count and weight densities of chert and obsidian in the E2 samples. What is clear from these graphs is that there is an extraordinary amount of obsidian in these samples. In the Ubaid macrolithic assemblage chert artifacts always far outnumber obsidian artifacts. This is also true of the microdebris taken from other Ubaid contexts where chert counts and weights are typically four times higher than obsidian (see below). Graph 2 shows an opposite trend. In the first four



	E.2.169.4	E.2.168.1	E.2.164.1	E.2.126.1	E.2.97.1	E.2.83.1	E.2.51.1
Chert	4.75	11.142	5	4.714	1.25	3.666	1.545
Obsidian	3.857	4.428	5.2	3.857	1	0.444	0.454



	E.2.169.4	E.2.168.1	E.2.164.1	E.2.126.1	E.2.97.1	E.2.83.1	E.2.51.1
Chert	0.267	0.289	0.096	0.252	0.165	0.203	0.168
Obsidian	0.124	0.046	0.105	0.168	0.053	0.003	0.109

Graph 2. Chert and obsidian densities based on count and weight ratios per liter from samples in trench E2.

samples in the sequence obsidian counts and weights not only represent a very significant portion of the overall lithic debitage, but in the third sample (E.2.164.1) obsidian counts and weight surpass those of chert. Interestingly, these densities drop off considerably in the last three samples (E.2.97.1.1, E.2.83.1.1 and E.2.51.1.1) when the ratio of obsidian to chert densities begin to resemble expected norms.

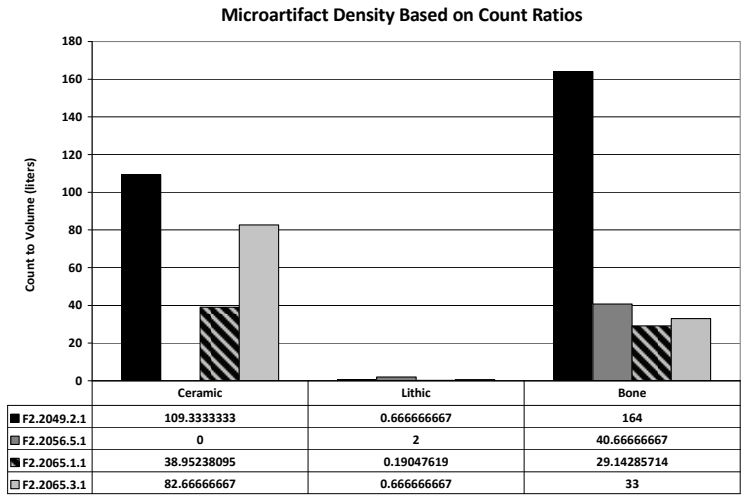
Preliminary Results from Late Chalcolithic Period Contexts

Much of the Late Chalcolithic material at Kenan Tepe was excavated between 2000 and 2005 in the lower town areas of F and G, located on a flat terrace east of the main mound (figure 2). As previously reported (Parker *et al*. 2008: 109-114), multiple superimposed architectural phases spanning the latter half of the fourth millennium BCE were excavated by UTARP team members in broad exposures of Area F. The most substantial phase is Level 4 where several large scale buildings were uncovered. The microsamples derived from these contexts permit two separate lines of study. The goal of the first study is to test basic assumptions about the designation of "indoor" and "outdoor" for particular spaces and the goal of the second is to examine diachronic variation in microartifacts to chart shifts in domestic activities within the use-life of a single building.

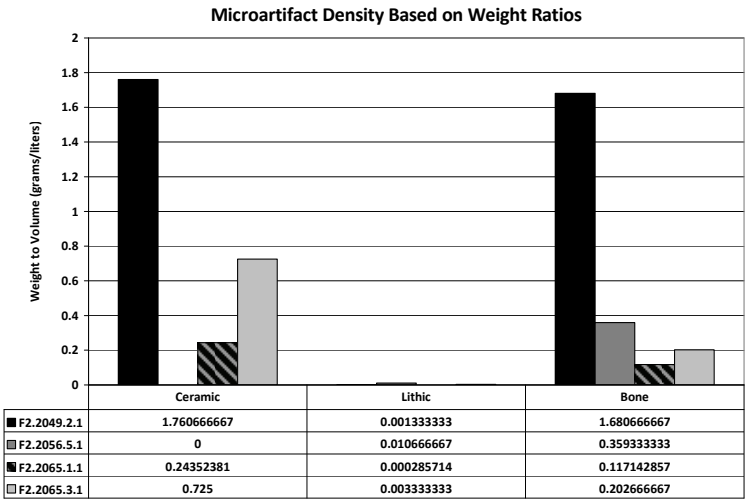
The first study utilizes data from a well preserved structure located in trench F2, level 4 (figure 9). Carbon dated to cal. 3360-3020 BCE,[10] this large building was composed of plastered mud brick walls 0.5 meter thick. A plastered platform was bonded with the interior of the eastern wall of this building whose floors were composed of multiple phases of smoothed mud plastering. A unique installation in the northwest corner of the building is a string-cut base bowl that had been sunk into a shallow ashy pit and plastered over so that the rim of the vessel was flush with the indented surface (Parker *et al*. 2008: 167-168, figures 13 A and 14). Compacted pebble surfaces to the south and east of this building most likely correspond to alleyways or streets that were used for trash disposal (see below). A wealth of debris was uncovered at this building including ceramic fragments, grinding stones, a ceramic loom weight, a stone bead with multiple perforations, and an animal figurine (Parker *et al*. 2008: 175, fig. 27C). Two later intrusive pits also contained the remains of ceramics, mud brick, and plaster along with a badly damaged ceramic animal figure, cylinder seal (Parker *et al*. 2008: 176, fig. 28C), and bones from a variety of animals including sheep and goat, bovines, hares, and possibly gazelle (S. Kansa, per. comm.).

A total of four HAP samples were collected from several contexts in and around this structure including a surface covered with a layer of pseudomorphs (F2.2056.5.1), a large mud plastered floor (F2.2065.1.1, F2.2065.3.1), and what we interpret based on the macroartifact assemblage as a street, alleyway or compacted midden (F2.2049.2.1). Thus based on our architectural understanding of this structure, three samples represent "indoor" areas while one sample comes from an "outside" zone. To test this assumption, we calculated the density of the three most common microartifact types–ceramic, lithic, and animal bone–based on count and weight to volume ratios (graph 3). One sample (F2.2049.2.1) stands out as the highest count and weight density for two of three microartifact categories despite being the smallest in sample volume at 1.5 liters.

[10] F.2.2065.10. Beta – 208205. AMS standard delivery (charred material). 2-Sigma calibrated result (95% probability): B.C. 3360-3020.



	Ceramic	Lithic	Bone
F2.2049.2.1	109.3333333	0.666666667	164
F2.2056.5.1	0	2	40.66666667
F2.2065.1.1	38.95238095	0.19047619	29.14285714
F2.2065.3.1	82.66666667	0.666666667	33



	Ceramic	Lithic	Bone
F2.2049.2.1	1.760666667	0.001333333	1.680666667
F2.2056.5.1	0	0.010666667	0.359333333
F2.2065.1.1	0.24352381	0.000285714	0.117142857
F2.2065.3.1	0.725	0.003333333	0.202666667

Graph 3. Microartifact densities based on count and weight ratios per liter from samples in the trench F2 Late Chalcolithic structure.

Rainville (2005: 49-54) has argued that there are correlations between specific contexts or loci and microartifact signatures such that outdoor spaces like streets, exterior surpra-floors and surfaces contain the highest density of microceramics, bone and lithic.[11] This very dense accumulation of microdebris in sample F2.2049.2.1 supports this correlation made by Rainville that, when combined with the dense accumulation of macroartifacts in this same space, identifies this context as a midden or street.

[11] This notion has been challenged by Cessford (2003) who argues that increased microartifact density could also reflect surfaces or areas with longer occupation.

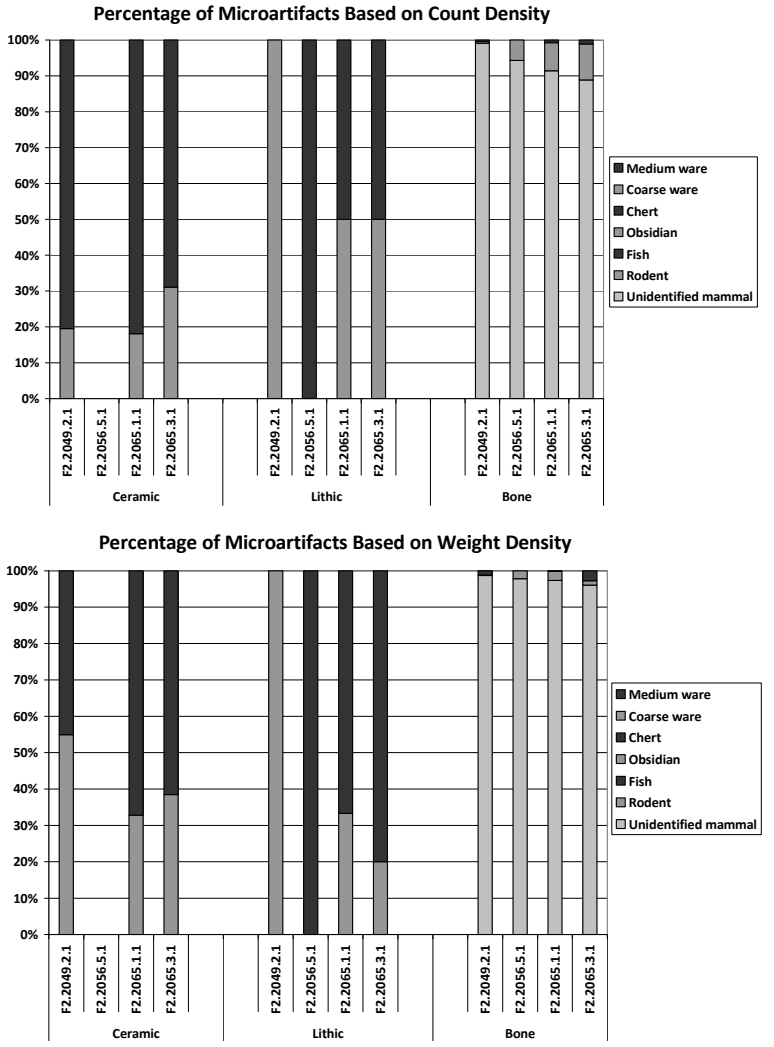
The other samples (F2.2056.5.1, F2.2065.1.1, F2.2065.3.1) share roughly the same densities but exhibit significantly fewer microartifacts than the outdoor space, especially for microceramics and microbones. While this trend could be due to diminished use of this space in general for production or consumption-based activities, we instead theorize that the low density of microartifacts is due to habitual cleaning of inside work surfaces as documented by numerous ethnoarchaeological observations and other microarchaeological studies (Rainville 2005, Özbal *et al*. 2004).

Returning to the outdoor midden or street, one interesting note is the lack of variety in microartifact subtypes that one would expect to find in a general-use refuse area. While this does not lessen our appropriation of sample F2.2049.2.1 as an outdoor midden or street, it instead highlights who actually used the space, i.e. deposited trash there. As diagramed in graph 4, the ratio of coarse to medium ware microceramics are relatively proportionate between the midden sample and those from inside the structure. The same is true for the percentage of specific faunal types like fish, rodent, and unidentified mammal. There is however a divergence when we consider chert and obsidian densities. One hundred percent of the lithic material recovered from the exterior midden is chert, while both chert and obsidian are found within the interior floors. This occurrence is rendered insignificant however when we reconsider the extremely low density of microlithics overall in this context (graph 3). Thus the trend in the percentage of microartifact subtypes between indoor and outdoor samples suggests that the waste or byproducts from certain activities carried out within this structure were deposited directly outside in the street.

The second study focuses on eight superimposed microsamples that were collected from a complex of buildings in trench F7 that date between cal. 3360-3020 BCE (figure 10).[12] The largest of these buildings was a 2.5 by 2.5 meter structure composed of two magazine-type rooms roughly 0.75 meter wide and 2 meters long. These rooms opened onto an undeveloped area devoid of architecture or other discernable features. North of the building was a deep pit filled with ash and other debris that had been partially covered or sealed by a 1 centimeter thick compacted mud layer and lined by a single row of mud bricks. A shallow ovoid-shaped bin adjacent to this pit was also lined with mud plaster and flanked on the east by a mud brick wall.

To the northwest, the remains of a second building were damaged by a later pit, however there was enough evidence to show prepared mud plastered floors that were bonded to the remaining walls that divided this space into two cells or rooms. At least two surfaces in Cell 1 and six surfaces in Cell 2 had been constructed during the use-life of the structure. Unfortunately without more precise dating of each separate surface, it is

[12] F.7.7094.28. Beta – 180240. AMS standard delivery (charred material). 2-sigma calibrated result (95% probability): B.C. 3360-3020. As discussed in a previous publication (Parker *et al*. 2008: 112), Trench F7 has multiple building phases (A-E) for Level 4. Without a finer degree of carbon dates, the ability to link these phases with Level 4 architecture from surrounding trenches is made extremely difficult. While future analysis of the excavation data will no doubt shed light on these sub-phases, for present clarity the Level 4 building in Trench F2 discussed above is not contiguous with the Level 4 building complex discussed presently.



Graph 4. Percentages of microartifact subtypes based on count and weight densities from the trench F2 Late Chalcolithic building.

impossible to link up the two spaces chronologically, to know the length of time in which each surface was "in use" or the length of time between surfaces. With these parameters in mind, this diachronic survey will encompass only those samples from Cell 2 whose chronological scheme is based on order of deposition.

Graph 5 displays the densities of microceramics, lithic and bone based on count and weight to volume ratios for the six samples collected from Cell 2. These are listed in chronological order of deposition from left to right. The level of microceramics, which include fine, medium, and coarse wares, is relatively steady throughout the use-life of this

space save for two notable exceptions. One sample (F7.7189.1.1) reflects a general trend based on both count and weight densities for more intensive use of ceramics during this phase. The other sample (F7.7170.1.1) shows a dramatic increase that is visible only in count density, meaning there are a higher number of lightweight pieces. This trend most likely represents more intense fracturing of the microceramics as opposed to a general higher density. This fracturing could derive from excessive trampling if this space served as a walkway or busy kitchen area or if the ceramics used in this space were especially friable (such as cooking pots) or frequently used (such as "everyday tableware" like serving vessels and cups).

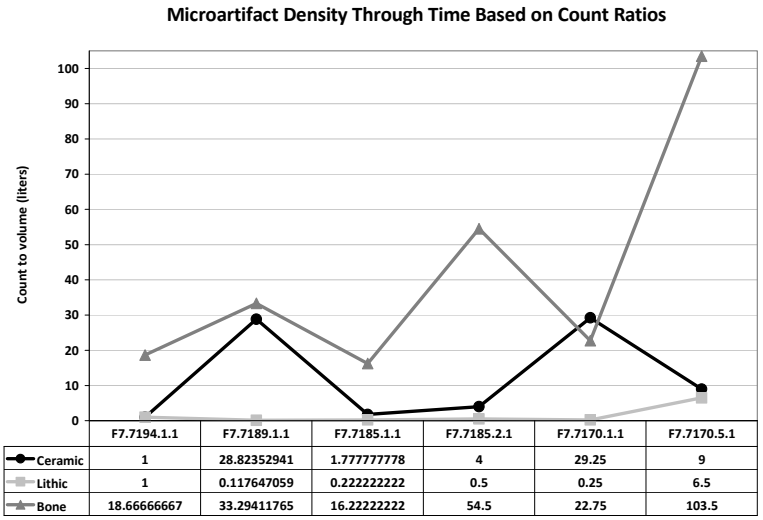
To explore the space functionality further, graph 6 breaks down the microceramic densities for each sample by fabric type. For sample F7.7170.1.1, only medium and coarse ware microceramics are present. In the macroceramic assemblage, these types are represented by serving and storage vessels (open platters, bowls, storage jars) and cooking pots respectively (Creekmore 2007; Parker and Foster *in press*). By nature cooking pots and serving vessels are more prone to chipping and breakage because of their portability and daily use compared with storage vessels that are often large and immobile. Based then on the high fragmentation rate discussed above, the medium ware microceramics most likely represent serving and eating vessels. As graph 6 shows, there is a large number of medium wares that weigh less than the smaller amount of coarse cookpot wares that are larger in size and weight. This trend in smaller, lighter, more fragmented medium wares suggests a higher use of serving-type vessels during this phase.

Returning again to graph 5, this same trend is not visible for lithic remains, which include both chert and obsidian. Their levels are exceptionally low in both count and weight density throughout all the samples except for one (F7.7185.2.1). For this sample, the large increase in lithic weight density is not reflected in the count density, where the level remains significantly low, signaling the presence of a small number of large microlithic pieces.[13] This signature of generally low lithic density suggests that activities involving chipped stone, such as production, modification and use, were not occurring throughout the use-life of this space. This is interesting since animal bone retains the highest count density of all the microartifacts throughout the majority of the samples (graph 5). Thus it can be argued that butchering of animals that would require stone tools was not taking place here. Instead other activities were taking place such as cooking, eating, or depositing of animal bones that included fish and small to medium-sized mammals like sheep and goat through trash disposal.

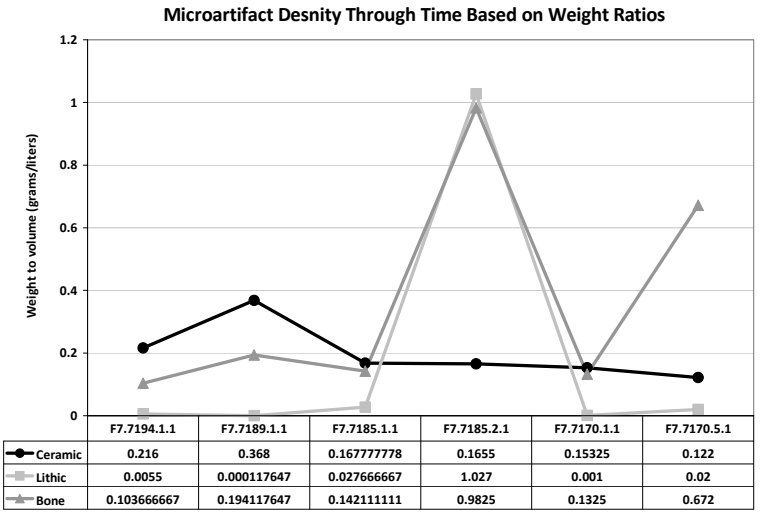
While the density of microbone remained relatively constant through time,[14] there is a dramatic increase in the latest sample (F7.7170.5.1) that suggests a higher level bone processing (to extract marrow, for example) or consumption of meat during this phase. Reflecting once again on the microceramic data in graph 6, the level of coarse cookpot

[13] This increase could also be due to the high volume of this particular sample (9 liters), which is twice the volume of the other samples.

[14] Except for sample F7.7185.2.1; see above.



	F7.7194.1.1	F7.7189.1.1	F7.7185.1.1	F7.7185.2.1	F7.7170.1.1	F7.7170.5.1
Ceramic	1	28.82352941	1.777777778	4	29.25	9
Lithic	1	0.117647059	0.222222222	0.5	0.25	6.5
Bone	18.66666667	33.29411765	16.22222222	54.5	22.75	103.5



	F7.7194.1.1	F7.7189.1.1	F7.7185.1.1	F7.7185.2.1	F7.7170.1.1	F7.7170.5.1
Ceramic	0.216	0.368	0.167777778	0.1655	0.15325	0.122
Lithic	0.0055	0.000117647	0.027666667	1.027	0.001	0.02
Bone	0.103666667	0.194117647	0.142111111	0.9825	0.1325	0.672

Graph 5. Microartifact densities through time based on count and weight densities from surfaces in the trench F7 Late Chalcolithic building complex.

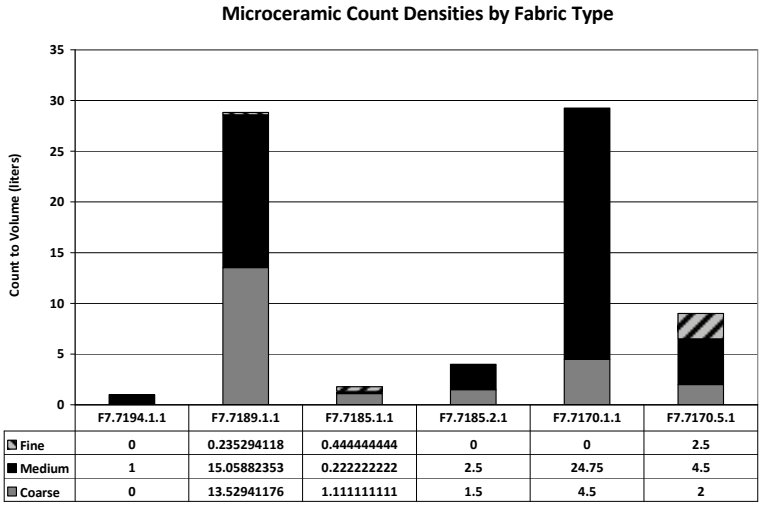
wares are at their lowest in this sample, while at the same time there is a roughly even amount of fine and medium wares in use. Coupled with the microbone data, we can then hypothesize that serving and the possible consumption of meals in this space increased at the final phase of the building perhaps due to the increase availability or use of fine ware ceramics that are traditionally reserved for eating and/or feasting occasions.

Microarchaeological Interpretations and Conclusions

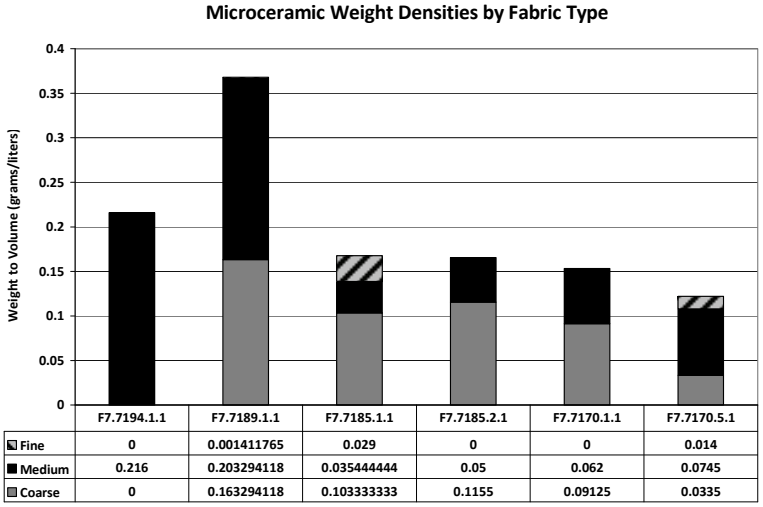
Microdata derived from sampling of domestic and other buildings and their associated features can provide a wealth of information concerning primary uses of space that is not always apparent or available through macroartifacts and traditional excavation techniques. This has been successfully demonstrated through the analysis of discrete Ubaid and Late Chalcolithic contexts presented above in order to elucidate function and space use for singular architectural entities (trench F2 building) and chronologically through time (trench E2, trench F7 building complex).

The Ubaid microdebris data allow interesting diachronic insight into the use of space in an outdoor work area from the end of the Ubaid period into the early part of the Late Chalcolithic period in trench E2. The data suggest that in the early part of the sequence, this space was the locus of considerable domestic activity including the processing and consumption of meat, the production and consumption of food and/or the manufacture, modification and use of lithic tools. All of the most common material categories (bone, ceramic and lithics) decrease through time suggesting a concomitant decrease in the use of this space for these activities. The decrease in bone microdebris is offset by an increase in bivalve shell microdebris. These data thus suggest that there was a shift from the consumption of meat in the early part of the sequence to a more mixed diet that included riverine mollusks by the end of the Ubaid period. Frequencies of both bone and bivalves are very low in the last two Late Chalcolithic samples. Whether or not this trend is localized to the particular area under study, or if it was a more widespread phenomenon, is uncertain at this point. Fluctuations in the densities of coarse fabric microdebris suggest that cooking occurred at the beginning of the sequence and the end of the sequence but was not prevalent in this location in the middle of the sequence. In the beginning of the sequence this location was the locus of considerable activity involving lithic tools. In fact, the extraordinary densities of obsidian, especially in E.2.164.1.1, support the hypothesis that the primary function of this space in the beginning of the sequence was obsidian tool manufacture or modification and that these activities shifted away from this area at the end of the Ubaid period.

Microsampling of the Late Chalcolithic structure in trench F2 positively identified indoor and outdoor areas as suggested by the architecture and artifact patterning, and confirmed through the microdata. The outside alleyway or compacted midden contained the highest count and weight density of microdebris, especially ceramic and bone, despite being the lowest volume of the samples. Relatively low densities of all major microartifact categories from samples inside the structure are reflective of habitual cleaning activities. When comparing the percentages of microartifact subtypes between the interior and exterior spaces, a uniform pattern is apparent and supports the hypothesis that debris derived from activities within the structure was disposed of in the convenient street or midden behind the building.



	F7.7194.1.1	F7.7189.1.1	F7.7185.1.1	F7.7185.2.1	F7.7170.1.1	F7.7170.5.1
Fine	0	0.235294118	0.444444444	0	0	2.5
Medium	1	15.05882353	0.222222222	2.5	24.75	4.5
Coarse	0	13.52941176	1.111111111	1.5	4.5	2



	F7.7194.1.1	F7.7189.1.1	F7.7185.1.1	F7.7185.2.1	F7.7170.1.1	F7.7170.5.1
Fine	0	0.001411765	0.029	0	0	0.014
Medium	0.216	0.203294118	0.035444444	0.05	0.062	0.0745
Coarse	0	0.163294118	0.103333333	0.1155	0.09125	0.0335

Graph 6. Microceramic count and weight densities by fabric type from surfaces in the trench F7 Late Chalcolithic building complex.

The microsampling of multiple superimposed Late Chalcolithic surfaces within the trench F7 building complex also allowed for a diachronic view of microdebris levels. Ceramics were consistently used in and around this space through time with intermittent increases in the use of medium wares such as serving vessels and coarse ware cook pots. Lithic production, modification or use was excessively low throughout the use-life of this space even though the occurrence of fractured animal bone remains was steady and relatively high. These data suggest that while butchering most likely occurred elsewhere, the cooking, consumption or disposal of animal-related food or products were

consistently happening in this space throughout the use-life of the structure. A significant increase in the density of bone during the final phase of habitation coincides with a shift in ceramic types whereby there is a large percentage of medium and fine ware serving vessels compared to coarse cooking wares. These data suggest that there was a significant increase in serving of meat foodstuffs perhaps instigated by more communal-style eating or feasting (Pearce 2000) as evidenced by the significant inclusion of fine ware ceramics in the microdebris that most likely included cups, bowls, and raised plates based on the macroceramic assemblage (Creekmore 2007, Parker *et al*. 2008, Parker and Foster *in press*).

UBAID PERIOD CERAMICS

Introduction and Methodology

Although the elaborately painted ceramics that characterize the Ubaid period have been the focus of considerable discussion over the past century, only a few researchers have sought a broader understanding of Ubaid assemblages by focusing on the quantification, rather than the qualification, of Ubaid ceramic data. This is at least partially due to the fact that in many recent excavations horizontal exposures have often been limited and thus even when researchers have sought to characterize whole assemblages the application of such analyses have been hindered by small sample sizes and limited spatial exposure (cf. Akkermans 1988a and Schwartz 1988). During the 2008 study season, UTARP team members aimed to address this situation by conducting an attribute analysis of all Ubaid period ceramics recovered from secure contexts at Kenan Tepe. To conduct such an analysis UTARP team members analyzed a total of 15,215 sherds.[15]

Bags from secure loci were first counted and weighed. Ceramics were then separated into three broad fabric categories: coarse, medium, and fine fabrics. Coarse fabrics are characterized by large chaff and grit temper and often contain large grit inclusions. In addition, coarse fabrics are frequently incompletely fired, grading to black at the core. Medium fabrics are composed of medium grit and some chaff temper. Ceramics composed of medium fabrics are often incompletely fired exhibiting a black core. Many examples are chaff faced. Fine fabrics are characterized by well levigated clay tempered with fine to very fine grit. Ceramics composed of fine fabrics tend to be well fired exhibiting an even color throughout. Ceramics composed of fine fabrics are often prone to over-firing, which results in a greenish color. Once separated into fabric types, ceramics were further divided into body sherds and rim sherds. For body sherds we recorded the surface treatment, the presence or absence of decoration, decorative motif

[15] This figure includes rim and body sherds (14,190), 123 bases and 20 handles. In cases when joins could be found or sherds obviously belonged to the same vessel they were included in the total count but were only counted once in our statistical analyses.

(on decorated sherds), the estimated vessel size,[16] the presence or absence of sooting or carbonization (Skibo 1992), and the wall thickness of each sherd at its thickest point. We analyzed the rims sherds in a similar manner, recording the surface treatment and decoration, the presence or absence of sooting and carbonization, and sherd thickness (measured 1 centimeter below the rim). In addition, rims were classified into types and rim diameters and percentages of preservation were calculated using a ceramic diameter chart. Bases and handles were recorded in a similar fashion.

Previous analyses of the stratigraphic sequence at Kenan Tepe have shown that Kenan Tepe's Ubaid period can be divided into 4 phases. Carbon 14 determinations (from *Ubaid Phase 2* [Parker *et al.* 2005:72]) suggest that the earliest phase in this sequence dates to before approximately 4700-4600 BCE. The presence of significant quantities of flint-scraped bowls in the last phase of Kenan Tepe's Ubaid period sequence (Kenan Tepe's *Ubaid Phase* 4) suggest an end date for the sequence somewhere around 4400-4200 BCE (Algaze 1994; Balossi-Restelli 2008; du Plat Taylor 1950; Kennedy 2008; Schwartz 2001). Due to the preliminary nature of this study, no attempt has yet been made to chronologically divide the Kenan Tepe Ubaid ceramic corpus.[17] Instead, this analysis attempts to come to a broad understanding of these data by viewing the corpus as a whole. We fully acknowledge that chronological variation within the corpus may introduce certain biases into the current analysis.

Preliminary Results

The corpus of ceramics analyzed consists of 11,990 body sherds and 2200 rim sherds. When broken down by fabric these totals are made up of 3290 coarse fabric sherds (23.19%), 6182 medium fabric sherds (43.57%), 4,712 fine fabric sherds (33.21%) and 6 sherds (0.04%) whose fabric was indiscernible. A breakdown of these totals by surface treatment is displayed in table 2. A number of interesting observations are immediately apparent from these data. To begin with, these data confirm our earlier supposition (Parker *et al*. 2006: 91-92) that Ubaid painted decorations are most common on vessels composed of fine fabrics (75.43%). They also show that fine ware sherds usually belong to medium or small sized vessels (table 5).[18] However, perhaps the most important statistic that these data reveal is the total percentage of painted ceramics in the corpus. In spite of the fact that the finely painted Ubaid ceramics are emblematic of the Ubaid "culture" and period, painted ceramics represent only 16.73% of the overall

[16] Vessel sizes are based on estimated vessel diameter. Sizes recorded in this analysis are small (0-14 centimeters), medium (15-29 centimeters), large (30-44 centimeters) and extra large (45 centimeters +).

[17] A complete analysis of these data, which includes a diachronic analysis, is currently in preparation.

[18] 62.85% of fine fabric body sherds belong to medium sized vessels (15-29 centimeters in minimum diameter). 34% of fine fabric body sherds belong to small vessels (less than 14 centimeters in minimum diameter).

Surface Treatments	Count	Percentage
Untreated	4689	32.99
Burnished	1447	10.18
Incised	35	0.25
Scraped	591	4.16
Slipped	2730	19.21
Smoothed	2299	16.18
Paint on Untreated Fabric	551	3.88
Paint on Slipped Fabric	1826	12.85
Impressed	44	0.31
Total[19]	*14212*	*100.00*

Table 2. Distribution of surface treatments in the Kenan Tepe Ubaid ceramic corpus.

Rim Type	Total	Percentage
Round Straight Rim	1241	56.41
Flat Straight Rim	93	4.23
Everted-Beaded Rim	62	2.82
Straight Ledge Rim	62	2.82
Incurved Round Rim	136	6.18
Incurved Flat Rim	76	3.45
Incurved Inverted-Beaded Rim	3	0.14
Inverted-Beaded Rim	6	0.27
Angle Rimmed Globular Jars	270	12.27
Tall Straight-Necked Jars	43	1.95
Straight-Necked Jars	34	1.55
Short Angled Rim Jars (cookpots)	150	6.82
Undetermined	24	1.09
Total	*2200*	*100.00*

Table 3. Distribution of rim types in the Kenan Tepe Ubaid ceramic corpus.

assemblage from Kenan Tepe (table 2).[20] Although this conclusion is not unexpected, there is little hard data in the literature to support this expectation. Furthermore, in spite of the fact that the ratios presented here cannot be seen as representative outside of the Kenan Tepe corpus, anecdotal evidence suggests that roughly similar ratios are likely at other Ubaid sites. This observation highlights how aesthetic bias can influence publication priorities and, in turn, how publication can color scholarly perceptions of material culture.

The overall percentages of fabric types show that there is a clear dominance of vessels composed of medium fabric that make up 43.57% of Kenan Tepe's Ubaid period assemblage. As expected, only a small percentage of vessels composed of medium fabric are painted (8.98%). Medium fabric sherds most commonly belong to medium sized vessels (medium sized vessels make up 71.86% of medium fabric body sherds [table 5]). Even more interesting is the fact that medium sized jars composed of medium fabric are the most common jar form in the Kenan Tepe corpus. Our assumption is that undecorated medium sized jars (ca. ≥30 centimeters) were used for storage. However, this type of jar was clearly not meant to be completely stationary: even when full of liquid, medium jars

[19] The total number of surface treatments is greater than the number of sherds analyzed due to the presence of sherds with multiple surface treatments.

[20] One caveat to this figure should be mentioned. Some slipped and untreated sherds (which make up 19.21% and 32.99% of the assemblage respectively) may represent unpainted portions of vessels whose body was only partially painted. Although this is certainly something to consider, our interpretation is that even if this is the case, the percentage of painted to unpainted vessels in the Ubaid corpus would not be increased substantially.

Rim Type and Vessel Fabric	Count	Average Rim Diameter (cm)	Standard Deviation (+/-)
COARSE FABRIC			
Round Straight Rim	70	20.11	8.80
Flat Straight Rim	4	24.00	6.98
Everted-Beaded Rim	4	37.25	14.59
Straight Ledge Rim	8	42.50	18.63
Incurved Round Rim	6	17.83	4.17
Incurved Flat Rim	3	15.67	8.14
Incurved Inverted-Beaded Rim	1	28.00	0.00
Inverted-Beaded Rim	1	20.00	0.00
Angle Rimmed Globular Jars	11	25.27	16.40
Tall Straight-Necked Jars	9	18.78	6.98
Straight-Necked Jars	5	18.40	4.72
Short Angled Rim Jars	79	18.95	5.66
MEDIUM FABRIC			
Round Straight Rim	369	18.06	4.18
Flat Straight Rim	41	20.98	5.84
Everted-Beaded Rim	15	17.80	4.36
Straight Ledge Rim	33	36.85	15.60
Incurved Round Rim	46	17.56	4.44
Incurved Flat Rim	24	18.29	4.31
Inverted-Beaded Rim	5	23.60	5.86
Angle Rimmed Globular Jars	68	22.41	8.95
Tall Straight-Necked Jars	19	16.73	12.73
Straight-Necked Jars	10	13.20	4.24
Short Angled Rim Jars	21	18.05	7.11
FINE FABRIC			
Round Straight Rim	509	14.77	4.59
Flat Straight Rim	34	19.47	5.28
Everted-Beaded Rim	28	13.86	3.69
Straight Ledge Rim	11	25.18	11.44
Incurved Round Rim	59	17.44	3.95
Incurved Flat Rim	35	17.06	4.43
Incurved Inverted-Beaded Rim	1	28.00	0.00
Angle Rimmed Globular Jars	46	15.83	9.90
Tall Straight-Necked Jars	9	10.67	5.02
Straight-Necked Jars	12	14.33	3.70
Short Angled Rim Jars	8	16.38	8.77
Total	*1604*	*17.80*	*7.50*

Table 4. Average rim diameter by rim type and vessel fabric.

could likely be moved by a single person. Although the practical implications of these data are open to various interpretations, we suggest that this emphasis on medium sized jars is likely indicative of an economy based on autonomous household units. We speculate that medium sized jars served the storage needs of households since they allowed flexibility and mobility in an economy that emphasized the storage of multiple small parcels for periodic consumption.

Table 2 also displays a number of interesting characteristics of Ubaid surface treatments. First, these data confirm that the majority (67.01 %) of the ceramics from Kenan Tepe's Ubaid corpus exhibit some sort of surface treatment. They also show that the majority of painted decorations appear on a slipped fabric (76.82%). While burnished and smoothed ceramics are not dominant in the assemblage they are not uncommon (10.18% and 16.18% respectively). Incised and impressed ceramics, on the other hand, are extremely rare (0.25% and 0.31% respectively).

Another interesting trend apparent in Kenan Tepe's Ubaid ceramic corpus is evident in the distribution of rim types (tables 3 and 4). These data show that the Ubaid ceramic assemblage from Kenan Tepe is dominated by open bowls (round straight rims, flat straight rims, and everted-beaded rims) which make up 63.46% of the assemblage (table 3). Table 4 displays the approximate size of various vessel types. Here it is apparent that open vessels are most commonly relatively small in size. These combined data suggest that among serving vessels there is an emphasis on individual, rather than communal, consumption. This interpretation draws an interesting contrast to the Late Chalcolithic 3-4 assemblages in northern Mesopotamia which are characterized by large "hammerhead" bowls and casserole jars (Akkermans 1988b; Creekmore 2007; Parker and Dodd 2005; Pollock and Coursey 1995; Schwartz, 2001) which have been interpreted as serving vessels for the communal consumption (Bernbeck and Costello in press; Pearce 2000).[21]

There are a significant number of cooking vessels in the Kenan Tepe Ubaid ceramic corpus. Cookpots are identified by their coarse grit temper with large mineral inclusions, lightly burnished exterior, and sooted or carbonized surfaces (1,032 or 31.37% of coarse fabric sherds show evidence of sooting or carbonization). The most common rim form for cookpots is the short angle-rimmed globular jar, which constitutes 79 (roughly 28%) of the 280 coarse fabric rims analyzed (table 3). It is significant that no cooking platters or baking trays have been identified in Kenan Tepe's Ubaid period ceramic corpus. Since there is no evidence of copper pans or cooking trays during the Ubaid period, we have to assume that most foods were cooked in cookpots such as these. Andirons recovered at Kenan Tepe suggest that cookpots were balanced over wood, charcoal or dung fires. Although skewered meats were likely common, stews that were probably slowly cooked in deep cookpots likely formed a significant part of the Ubaid cuisine.

[21] It is important to note, however, that the prevalence of small open vessels could be the result of frequent breakage and therefore small open bowls may not be as prominent in the Ubaid assemblage at any given moment as our data suggest.

Fabric and Vessel Size	Count	Percentage
Coarse Fabric Small Vessel	79	0.81
Coarse Fabric Medium Vessel	1232	12.57
Coarse Fabric Large Vessel	653	6.66
Coarse Fabric Extra Large Vessel	141	1.44
Medium Fabric Small Vessel	277	2.83
Medium Fabric Medium Vessel	3172	32.36
Medium Fabric Large Vessel	859	8.76
Medium Fabric Extra Large Vessel	106	1.08
Fine Fabric Small Vessel	1116	11.39
Fine Fabric Medium Vessel	2063	21.05
Fine Fabric Large Vessel	102	1.04
Fine Fabric Extra Large Vessel	1	0.01
Total	*9801*	*100.00*

Table 5. Distribution of vessel size by fabric type for body sherds.

UBAID BURIALS

The following section details five burials recovered during the 2007 excavation season and one burial from the 2005 season. Four of these burials date to Kenan Tepe *Ubaid Phase 4* and two date to Kenan Tepe *Ubaid Phase 1*. Given the available radiocarbon dates, we can say that Kenan Tepe's *Ubaid Phase 1* belongs to the period before the destruction of *Ubaid Structure 4* (carbon dated to ca. 4700 BCE [Parker *et al.* 2005:72, 90; 2008:106]). Kenan Tepe's *Ubaid Phase 4* belongs to the terminal Ubaid period (approximately 4400-4200 BCE). All of the burials reported here are of children ages five or younger and for this reason sex is not attributed. None of the skeletons exhibited any observable pathologies. All information on the burials was collected following the methods detailed in Buikstra and Ubelaker (1994). Age was determined primarily on dental eruption and development patterns taken from Ubelaker (1989), but was also supported by observations of epiphyseal union. This report completes our analysis of the human remains from Kenan Tepe and brings the total burials belonging to the Ubaid period to nine (Parker *et al.* 2008:131-134).

Individual D.4.4128.1

This skeleton was discovered in relatively poor condition. Many elements, especially the skull, are fragmented but the vertebrae and long bones are in decent condition and most of the dentition is accounted for. Age of this individual was determined from a combination of dental eruption pattern and degree of epiphyseal union. Observation of the skeleton revealed that all epiphyses remain unfused except for those of the vertebral neural arches that have completely fused together. The fusion of the neural arches provides a minimum age of 1 year, while the fact that no other elements have

begun to fuse provides a maximum age of 5. Based on the overall dental pattern this age range can be narrowed down to an estimate of 2 years ± 8 months. This determination is based on the lack of root formation in the permanent molars but complete crown formation, along with only ¾ root formation of the mandibular deciduous canines.

This burial appears to have been treated similar to two other Ubaid burials uncovered in 2007 (D.8.162.1 and D.6.145.1 discussed below). Remains of organic matter under the burial D.4.4128.1 suggests that this individual was placed in a basket or thick cloth then set into a simple prepared burial pit. The burial pit was dug into an outside surface dated to Kenan Tepe *Ubaid Phase 4* (terminal Ubaid period ca 4400-4200 BCE).

Individual D.5.5221.1

This infant burial was uncovered during the 2005 excavation season from the Ubaid contexts in trench 5. The individual was recovered in excellent condition, except for the fragmentary nature of the skull. The good preservation of this individual is likely a result of the burial context, as the infant was buried in a small ceramic vessel placed into a prepared burial pit. The burial pit was dug into an ephemeral outside surface.

Unfortunately no dentition was recovered other than the deciduous mandibular second molar. For this reason, age determination was primarily based on epiphyseal union. Observation of all skeletal elements revealed the complete absence of any epiphyseal union. Based on this factor along with the overall small size of the child, it is likely that this individual was late in the third trimester or died shortly after birth. If the development of the preserved deciduous molar is also considered, the combination of factors indicates that an age estimate of 7 months in-utero to 2 months old is appropriate.

Individual D.6.145.1

This skeleton was highly fragmented, although most of the long bones were present along with rib, vertebrae and skull fragments. Unfortunately only the right maxillary deciduous first molar was recovered from the dentition, making dental age determination speculative. Despite the fragmentary nature of D.6.145.1 it is possible to observe many epiphyseal surfaces. The absence of any epiphyseal fusion, along with the degree of development of the deciduous molar, indicates that this individual was between 7 months in-utero to 6 months of age.

The infant was discovered beneath a surface that was covered in a reed or grass mat (D.6.146) in what appears to be an outdoor area. This individual was interred in a basket. Although the basket itself did not survive this burial was characterized by slightly darker soil that was outlined by reed pseudomorphs, leaving the impression of the basket (figure 11). A single calcareous bead (D.6.145.1.1) was discovered with the burial.

Individual D.6.155.4

The skeleton of D.6.155.4 is a very complete, young individual in good condition. All long bones and vertebrae are present along with much of the skull, although it is

fragmentary, including the entire deciduous dentition and some permanent teeth. The excellent preservation of this individual makes it possible to obtain a very good estimation of dental age. Along with the deciduous dentition, the initial cusps of the permanent central incisors, maxillary canines and all first molars are present. Based on the overall pattern of dental development an age of 6 months to 1 year is appropriate. This age is supported by the lack of any epiphyseal union in the skeletal elements.

The burial was discovered in the northeast corner of trench D6 in a context that was associated with a surface covered in a reed or grass mat. The infant was placed in an unfired clay vessel and then covered with a ceramic bowl (figure 12 and 13). This method of interment is very similar to an infant burial uncovered in 2005 (D.8.54.1 [figure 14]) from under the floor of an Ubaid structure (Parker *et al.*, 2008; Hopwood 2008) suggesting at least some uniformity in burial practice for infants at Kenan Tepe during the Ubaid Period.

Individual D.8.162.1

The skeleton of D.8.162.1 was discovered in good condition. Unfortunately several elements were not present, including the left and right tibia and fibula, many cranial elements and of particular importance the mandibular and maxillary dentition. As a result of the incompleteness of the skeleton age could only be estimated based on epiphyseal fusion. None of the elements present have begun to fuse and observations suggest that many epiphyses had yet to form, although, a proximal and a distal femoral epiphysis are present. Based on the presence of these epiphyses this individual was likely a minimum of 8 months in-utero. Furthermore, based on the overall morphological pattern of the skeleton a conservative estimate for maximum age is 6 months old, although it is likely that this individual died much closer to birth.

The burial was discovered in an outside work area in proximity to a kiln pit and in association with numerous grinding stones. Similar to burials D.4.4128.1 and D.6.145.1, this individual was wrapped in a textile or placed into a finely made grass basket before being interred in a shallow pit (Figure 15).

Individual E.2.174.1

During the 2007 excavation season only a single burial was recovered from Area E. The skeleton was uncovered in very poor condition with most elements present but highly fragmented. Fortunately, most of the teeth were recovered and it was possible to collect some information on epiphyseal union due to the preservation of some vertebral elements. Based on the fusion of the thoracic neural arches and the absence epiphyseal fusion in any other skeletal elements, this individual is estimated to be between the ages of 1-6 years old. When this information is combined with observations from the preserved dentition, primarily the development of the deciduous dentition, the start of the M1's root formation and the completed crown formation of all other permanent teeth, a smaller age range of 4-5 years is appropriate.

The poor condition of this individual is likely a result of the burial context. Similar to the adult burial (E.2.146.6) recovered in the same trench in 2005 (Parker *et al.,* 2008:108-109, 132-133 and figure 10), and another subadult burial discovered in trench D8 also in 2005 (D.8.90.1 [Parker *et al.* 2008: 107, 131-132 and figure 6]), this individual was placed within a mud brick wall. During the Ubaid period at Kenan Tepe other children have been either buried in a basket or textile or covered by a ceramic vessel. In each case, however, these children were very young, dying before or shortly after birth. The different treatment of this individual (E.2.174.1) may be age related as it bears similarities to the two burials mentioned above. The fact that this child was older (between 12 and 18 years of age) may suggest that once an individual is past an infant stage, different burial practices became appropriate. The parallels between this and the two burials mentioned above (E.2.146.6 and D.8.90.1) also suggest that the burial of older individuals (either primary or secondary) may have occasionally served as foundation deposits for architectural units.

Skeleton	Phase	Sex	Age	Burial Context
D.4.4128.1	Ubaid Phase 4	?	2 yrs ± 8 months	Basket
D.5.5221.1	Ubaid Phase 1	?	7 months in-utero to 2 months	Ceramic vessel
D.6.145.1	Ubaid Phase 4	?	7 months in-utero to 6 months	Basket
D.6.155.4	Ubaid Phase 4	?	6 months to 1 year	Unbaked clay vessel covered with ceramic bowl
D.8.162.1	Ubaid Phase 1	?	8 months in-utero to 6 months	Basket
E.2.174.1	Ubaid Phase 4	?	4-5 years	Within mud brick wall

Table 6. Remaining Ubaid burials from Kenan Tepe.

Burial Summary

This report described the five burials excavated during the 2007 excavation season at Kenan Tepe, along with one burial excavated in 2005 (table 6). Burials were recovered from two separate areas around the main mound: five from Area D and one from Area E. All burials date from the Ubaid period. No pathology was observed on any of the individuals and due to the fact that all burials were of children ages five or younger it was not possible to assign sex. Of particular note is the varied burial practices represented at the site. Burial practices associated with child burials from previous excavation seasons have been discussed in Hopwood 2008. The burials excavated in 2007 further demonstrate that infants were given special treatment at Kenan Tepe, particularly during the Ubaid period. Three of the infants excavated in 2007 were apparently buried in textiles or baskets while the two other infant burials reported here were interred in ceramic or mud vessels. In contrast to these burials an older child was uncovered buried within a mud brick wall. The discrepancy between burials of infants and older children during the Ubaid period suggests that residents of Kenan Tepe engaged in differential age-based burial practices during this time.

ARCHAEOBOTANICAL REMAINS

Introduction

Between 2000 and 2007, UTARP team members collected more than 1000 archaeobotanical samples at Kenan Tepe spanning the Ubaid period, Late Chalcolithic period, Early Bronze Age and Middle Bronze Age. Samples were collected from a variety of contexts including house floors, outdoor surfaces, hearths, ovens, pits, burials, and collapsed walls. A number of samples were also collected from the contents of whole vessels. The comprehensive data collection program, which included high resolution sampling of most surfaces using the UTARP's Household Archaeology Protocol (HAP) sampling procedure,[22] allows both synchronic and diachronic investigations of plant use across the site. Approximately 700 archaeobotanical samples are currently stored at the University of Connecticut where analysis is ongoing.[23] This report presents preliminary results from five Ubaid and eight Late Chalcolithic samples (tables 7 and 8).

Methods

Sediment samples were floated using a modified Siraf-type flotation tank (Nesbitt 1995). Light fractions were collected in a 250 micron mesh screen and dried in the shade. The heavy fraction was transported to the University of Utah and the University of California, Berkeley, where it is undergoing intensive microartifact analysis (see above). The archaeobotanical remains were sorted under a binocular stereo-microscope, capable of magnifying up to 70×, and identifications were made using the comparative collection at the University of Connecticut. A range of flora and seed identification manuals were also used to assist with identifications and provide ecological and ethnobotanical information (e.g., Davis 1965–1985; Davis, Mill, and Tan 1988; Nesbitt 2006; van Zeist and Bakker-Heeres 1986). Since the results presented here are preliminary, seed counts are not provided, but relative abundances are discussed.

Preservation of Remains

The preservation of charred archaeobotanical remains at Kenan Tepe differs dramatically across the site owing mainly to differential exposure to fire. The Ubaid samples discussed here were all excavated from collapse and floor deposits within *Ubaid Structure 4*. As discussed above, *Ubaid Structure 4* was destroyed in antiquity by a catastrophic fire. This led to excellent preservation of the botanical remains within many of the Ubaid samples. Furthermore, since the destruction of *Ubaid Structure 4* represents a singular event, the data emanating from these contexts offer a "snapshot" of plant use within an Ubaid household and provide a rare opportunity to investigate the organization

[22] For discussion of UTARP's Household Archaeology Protocol or HAP sampling procedure see above under Microarchaeological Analyses. For a preliminary discussion of these data see Parker *et al.* 2003:121–125.

[23] Under the supervision of Alexia Smith, Philip Graham is conducting research on the Ubaid material for his doctoral dissertation. Alexia Smith is in charge of the Chalcolithic and Middle Bronze Age material.

of food production and consumption within a household context. The vast majority of the Late Chalcolithic samples have very different pyric histories. All of the Late Chalcolithic samples presented here come from Area F, on the northeastern edge of the lower town. The majority of theses samples originated from pits although two samples from supra-surface fill are also discussed. The samples from the pits most likely represent refuse or remnants from hearths and, as such, they present a time-averaged window into plant use at Kenan Tepe.

Ubaid Period Remains

Across the Near East, plant use during the Ubaid is very poorly understood and there is a paucity of archaeobotanical remains dating to this period. Hence, the large number of well preserved Ubaid archaeobotanical remains from Kenan Tepe is extremely significant. Initial inspection of the remains raises a number of interesting points regarding plant processing and plant foods within the *Ubaid Structure 4*. The five samples analyzed here all contain large amounts of wholly intact and readily identifiable cereals. Barley appears to be the most common, although large amounts of wheat are also present (in approximate order of abundance: *Triticum dicoccum, T. monococcum, T. aestivum/durum*). The quality of preservation in the Kenan Tepe samples is also reflected in the large amount of processing debris, such as rachis fragments and glume bases, as well as the relatively large amounts of small weed seeds. Crop legumes at Kenan Tepe include lentil (*Lens culinaris)*, *Vicia/Lathyrus,* and the occasional pea (*Pisum* sp.). Most of the legumes found so far are very well-preserved. Compared to the cereals, there are far fewer legumes represented in the samples. These results share some similarities with those dating to the 5th millennium B.C. from Tell Kurdu in the Amuq (Amuq D and E), where wheat and barley were important crops, although at Tell Kurdu preliminary data suggest that wheat was more common than barley (Yener et al. 2000). A lower frequency of legumes relative to cereals has been noted at many Near Eastern sites (e.g., Smith 2007) although in most cases low legume abundance is attributed to preservation biases. The fact that the archaeobotanical remains from Kenan Tepe's *Ubaid Structure 4* are so well preserved suggests that in this household, the disparity in cereal and legume abundance may not be due to differential preservation but instead to intensity or timing of use.

The spatial distribution of the finds is particularly interesting. Samples 3 and 4 (Table 8, D.4.4123.4.2 and D.4.4123.12.2) are both from a small room on the eastern side of the large central room of *Ubaid Structure 4*. These samples differ from the other three in that they contain a large amount of processing debris in the form of spikelet forks and glume bases and a greater frequency of weed seeds. Comparatively, the other samples are relatively "clean" containing mostly cereals with very little debris. The "clean" samples were excavated from the collapse in the central large room of *Ubaid Structure 4* and represent processed grain ready for use, or cleaned grain temporarily stored on the roof of that structure. The presence of charred dung in samples 3 and 4, combined with the mixture of chaff, field weeds and relatively small amounts of wood charcoal, suggests that these remains are from dung fuel stored within the eastern room (Miller 1984; Miller and Smart 1984). The presence of dung provides insight into the ancient diet of herded

animals at Kenan Tepe. Weeds within the samples include *Galium*/*Asperula* and *Vaccaria pyramidata,* both of which are common dry-land field weeds. Small legumes such as *Trigonella,* are also present (these can also be field weeds but frequently occur in pasture land). The presence of large amounts of culm fragments, rachis fragments, spikelet forks, charred dung, and wheat and barley grains suggest intentional foddering, although examination of more dung samples is necessary to determine whether this was common practice at the site.

Sample	Year	Tr.	Loc.	KT#	Item#	Phase	Mass (g)	Context type
1	2007	D4	4107	4	2	Ubaid 2/3	6.9	Top of collapse layer in *Ubaid Structure 4*
2	2007	D4	4112	5	2	Ubaid 2/3	3.4	Lower half of collapse in *Ubaid Structure 4*
3	2007	D4	4123	12	2	Ubaid 2/3	8.2	Contents of eastern room of *Ubaid Structure 4*
4	2007	D4	4123	4	2	Ubaid 2/3	4.3	Contents of eastern room of *Ubaid Structure 4*
5	2007	D4	4127	9	2	Ubaid 2/3	1.8	Above floor inside room of *Ubaid Structure 4*
6	2006	F9	9055	6	2	LC3/4	1.8	Pit
7	2006	F9	9055	7	2	LC3/4	2.0	Pit
8	2006	F1	1130	2	2	LC3/4	2.2	Pit associated with oven F4
9	2006	F9	9048	4	2	LC4	1.1	Suprasurface fill above L9049
10	2005	F9	9048	3	2	LC4	1.9	Suprasurface fill
11	2005	F7	7162	23	2	LC4/5	2.9	Pit
12	2006	F7	7181	17	2	LC4/5	1.1	Pit
13	2005	F7	7146	7	2	LC4/5	1.1	Pit

Table 7. Contextual information for samples presented in table 8.

Late Chalcolithic Remains

A total of 56 samples from Late Chalcolithic surfaces have thus far been examined at the University of Connecticut. Sadly, each of these samples was essentially sterile. Some samples contained the occasional poorly preserved cereal grain or slither of wood charcoal, but the volume of material was insufficient to draw any conclusions regarding plant use. While surfaces typically tend to yield little archaeobotanical remains (where catastrophic burning is not present), floors usually have some remains present. The consistent lack of plant remains across Late Chalcolithic surfaces is interesting and could result from either poor preservation conditions in the outer town, the existence of hard-packed/prepared floors that minimize the potential for charred material to become embedded in the sediment, or rigorous floor cleaning by the Late Chalcolithic inhabitants

of the site. The latter two suggestions seem the most likely given that the samples from pit contexts yielded a fair amount of botanical material.

Given the dramatically different pyric histories and contextual origins of the Ubaid and Late Chalcolithic samples presented here, comparisons between the two time periods cannot be reliably made at present. Once a wider variety of samples have been processed, comparisons will be possible. A number of general parallels can be drawn, however. Barley appears to be the most abundant and ubiquitous crop, followed by wheat. Both einkorn and emmer are present (*T. monococcum* and *T. dicoccum* respectively) as well as bread/durum wheat (*Triticum durum/aestivum)*. Since the wheat species occur in small frequencies, it is premature to consider relative abundances. Legumes, found in very small amounts, include lentil, bitter vetch (*Vicia ervilia),* and *Vicia/Lathyrus.* The only fruit found so far is grape, attested to by one Late Chalcolithic *Vitis* sp. pedicel.

Some of the Late Chalcolithic samples are dominated by wood charcoal. Assuming that the pits contain the refuse from hearths, this may suggest that wood was being used as a fuel. Such an interpretation carries environmental implications regarding the availability of wood in the area. It is also clear, however, that dung, which tends to be used in drier areas, was being used as a fuel during the Late Chalcolithic. Sample 11 contained intact charred sheep or goat pellets, charred dung fragments, and a range of weed seeds typical of a dung assemblage (*Adonis* sp., *Teucrium* sp., and small legumes such as *Medicago radiata* and *Astragalus* sp.). The sample also contained small amounts of wheat, barley, chaff. The zooarchaeological evidence from the site underscores the importance of sheep and goat rearing, so it makes sense that sheep or goat dung would have been used as a fuel (Parker *et al.* 2008: 114-122). Sheep or goat dung is a valuable fuel and continues to be used in certain parts of the Near East today. A small number of modern villagers at Tell Leilan in Syria, for example, still collect sheep and dung pellets that are used to fuel ovens. The pellets can easily be gathered in the field and then formed into larger bricks ready for burning.

Conclusions

During the Ubaid and the Late Chalcolithic periods, the main crops used at Kenan Tepe included einkorn, emmer, and bread or durum wheat, barley, and to a lesser degree legumes including lentil and bitter vetch. Grape is evidenced by one Late Chalcolithic pedicel. No oil crops have been discovered to date. Animal dung was a commonly used fuel at Kenan Tepe. Examination of two dung samples dating to the Ubaid suggests that animals were intentionally foddered for at least part of the year. It is premature to argue that this was common practice at Kenan Tepe. The analysis of more samples will allow us to determine the extent to which this practice was adopted across the site. During the Late Chalcolithic, large amounts of wood within pit contents suggests that wood was frequently used as a fuel, although dung continued to be used. Examination of more pit contexts dating to both the Ubaid and the Late Chalcolithic is needed to determine whether the relative use of dung versus wood shifted through time. Such a change could reflect changing environmental conditions. The samples from Kenan Tepe hold enormous potential to address questions of food production, processing and use as well as exploitation of environmental resources. The

	Ubaid Period					Late Chalcolithic Period							
Sample Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Hordeum sp.	xxx	x	xxx	xx	xxx	x	x	x	xxx	xx	x	x	x
Triticum sp.	x	x	xxx	x	xxx	x				x	x		
cf. *Triticum* sp.											x	x	
Triticum monococcum			x	x			x						
Triticum dicoccum	x	x	x		x	x	x	x		x	x		
Triticum durum/aestivum			x				x						
Triticum tail grains			x	x									
Cereal indet	xxx	xxx	xxx	xxx	x	x	x	x	x	x	x	x	x
Cereal rachis fr.		x	x	x		x				x			
Cereal spikelet forks	x	x	x	xx	x		x	x		x		x	
Cereal glume bases	x	x	xxx	xxx		x		x	x		x	x	x
Culm fr. > 2mm			x		x				x	x	x		
Culm fr. < 2mm		x	x	x	x	x	x	x		x	x		
Basal culm fr. < 2mm			x						x	x	x		
Lens culinaris			x	x		x	x		x	x			
Vicia ervilia											x		
cf. *Vicia* sp.											x		
Vicia/Lathyrus			x	x			x			x			
Lathyrus sp.												x	x
Pisum	x		x										
Leguminosae (large)			x								x		
Leguminosae (small)		x	x	x		x	x	x		x		x	x
Vitis sp. pedicel								x					
Adonis sp.											x		
Vaccaria pyramidata			x										
Rumex sp.						x	x	x		x			
Malva sp.								x					
Astragalus type								x			x		
Medicago radiata											x		
Trigonella sp.			x										
Cucurbitaceae				x									
Compositae				x									
Buglossoides tenuiflorum												x	
Buglossoides arvense											x		
Teucrium type											x		
Galium/Asperula		x	x	x		x	x	x	x	x	x		
Scirpus/Carex		x						x			x		
Gramineae	x	x	x	x	x	x	x		x	x		x	x
Hordeum sp. (wild)	x		x	x		x							
Lolium type												x	
Wood	x	x	x	x		xx	xx	x	xx	xx	x	x	
Vitrified Remains			x										
Sheep/goat dung			xx	x							x		
Mouse dung						x							
Small bone		x	x	x		x			x	xx			x
Shell		x											

Table 8. Contents of samples (x = present; xx=fairly abundant; xxx = many).

presence of well-preserved archaeobotanical remains from Ubaid period households also provides a unique opportunity to investigate how agricultural produce was managed inside individual households. These data can potentially be used to investigate issues of social stratification and privatization at Kenan Tepe during the Ubaid. Ongoing analysis of the archaeobotanical remains will determine spatial patterns of plant use and processing across the settlement. It will also allow us to reconstruct changes in crop production through time.

THE CHIPPED STONE ASSEMBLAGE FROM UBAID CONTEXTS

Over 6000 chipped stone artifacts made of chert and obsidian have been recovered from Ubaid contexts at Kenan Tepe. Chert in the form of large rounded cobbles, probably derived from the Tigris gravels and terraces, is the most commonly used raw material. When freshly broken, these cobbles are typically matt, slightly grainy and grey or beige grey in color. The cortex tends to be smooth, water worn and is often stained brown. Artifacts made of other more translucent and lustrous chert although present are rare. Obsidian on the other hand must have been acquired from much further afield since the nearest sources are over 150 kilometers to the north. Obsidian accounts for approximately 24% of the material in the Ubaid assemblage. When viewed in transmitted light the majority of the obsidian from Kenan Tepe is green in color, but some opaque and brown examples have been noted. Translucent grey colored obsidian is rare. Although definitive conclusions about the sources of the various kinds of obsidian used at Kenan Tepe must await geochemical analysis, it is likely that the majority of this material comes from Nemrut Dağ/Bingöl sources. Meydan Dağ is also a potential source (Flude pers. comm.). The obsidian varies in quality and some pieces have perlitic inclusions. Although the following discussion of the chert and obsidian remains from Ubaid contexts at Kenan Tepe supplements the reports in previous publications (Parker et al 2006:94-99; Healey forthcoming), this report should be considered preliminary until such time as a comprehensive analysis of these data is completed.

Trench	Cores	Struck Lumps	Flakes	Blades	Indet Frags	Retouched	Totals
D4	1	17	344	1	11	22	396
D6	18	51	1020	10	47	87	1233
D5?	9	14	318	14	72	11	438
D5	5	4	236	7	46	52	350
D8	23	31	817	43	28	93	1035
D10	3	1	67	1	3	8	83
E2	16	31	871	62	31	97	1108
Totals	*75*	*149*	*3673*	*138*	*238*	*370*	*4643*

Table 9a. Composition of the chert assemblage by trench. [24]

[24] Note that in this and the following tables in this subsection one row is marked "D5?" to indicate that the artifacts in this row come from less secure contexts.

Trench	Cores	Irreg fl lump	Pieces esquillees	Sbbfs	Blades	Flakes	Indet. frags	Edge retouch	Other	Totals
D4	0	0	4	2	34	42	7	14	2	105
D6	1	0	39	2	80	114	16	54	1	306
D5?	2	0	4	1	38	54	19	34	3	155
D5	2	1	7	3	46	72	4	44	3	182
D8	4	2	32	7	52	97	12	47	9	262
D10	0	0	2	0	5	18	0	4	0	29
E2	8	0	27	2	37	278	50	23	3	428
Totals	*17*	*3*	*115*	*17*	*292*	*675*	*108*	*220*	*21*	*1467*

Table 9b. Composition of obsidian assemblages

Chert

The reduction trajectory used at Kenan Tepe is basically one of flake production. Reconstructable nodules from later contexts suggest that little preparation or shaping was carried out before raw materials were knapped for the manufacture of lithic tools. The rounded shape of both the reconstructed nodules and cobbles gathered by UTARP team members along the banks of the Tigris suggest that chert cobbles were smashed open to provide a suitable surface from which to begin flaking. The cores vary in size from about 40 to 60 millimeters in diameter. Both uni- and multi-directional flaking is present and step fractures are not uncommon on flaking faces (D.8.134.20 for example [figure 16 A and B]). Pronounced negative bulbs of percussion and ring cracks on the striking platform of some cores suggest that a hard hammer was used at least at this stage of reduction. There are also a number of flakes with very abraded areas on their dorsal surfaces suggesting that they come from hammerstones. The range of the dimensions of the flakes more or less corresponds to that expected from the cores described above; they range in size from less than 20 to around 60 millimeters in length, although most are between 30 and 50 millimeters in length. They are generally squat in shape and often exhibit hinge terminations. The corresponding 'steps' are also observed on the cores. Occasionally pieces with blade-like characteristics (figure 16 E and F) occur in chert but so far no blade cores have been noted in Ubaid contexts.

Trench	Piercer	Truncated, backed	Scraper	Other	Denticulated edges	Edge-retouch	Totals
D4	0	11	0	2	3	6	22
D6	9	27	0	13	17	21	87
D5?	2	4	1	1	1	2	11
D5	10	4	5	9	7	17	52
D8	9	20	1	6	12	45	93
D10	0	5	1	0	1	1	8
E2	17	33	7	6	11	23	97
Totals	*47*	*104*	*15*	*37*	*52*	*115*	*370*

Table 10. Chert retouched artifacts.

Retouched Pieces. There is a limited range of retouched classes present (summarised in table 10) although these categories are represented by a number of different forms. Edge-retouch pieces are blanks (flakes and blade-like pieces) with retouch along one or more edges, which does not significantly alter the shape of the blank. It is sometimes difficult to be sure whether the retouch was deliberate, was occasioned in use, or was caused by post-depositional damage.

Arrowhead and Bifacial Artifacts (Figure 16 C and D). A single arrowhead manufactured from fine grained pinkish-grey chert was discovered in fill upon the floor of a small side room of *Ubaid Structure 4* (D6.177.7). The ventral face of this artefact exhibits invasive flaking on the distal portion becoming less invasive on the lower edges, where the retouch is executed from the ventral surface on one edge, but the dorsal on the other. The bifacial fragment (D8.91.9 [figure 16 D]) probably of a leaf-shaped object is finely worked with very regular serial flaking on both faces.

Truncated, Backed and Glossed pieces (figure 16 E-K). The artifacts discussed in this subsection include flakes and blades of various sizes. Most have one or both ends truncated by retouch, others have abrupt retouch along one edge creating a back and several are both truncated and retouched. A distinctive feature of some examples is that one truncation is inversely executed or the retouch forming the back is direct for most of its length but becomes inverse as it reaches the end (figure 16 J). Some are quite small (figure 16 F) and a number are backed (figure 16 H) either with abrupt retouch or cortex (figure 16 J and K). A few are crescentric (figure 16 J and K). About 25% of these artifacts exhibit gloss making glossed pieces relatively unusual (only about 10%) in the overall retouched Ubaid lithic assemblage from Kenan Tepe. However, it is likely that glossed pieces may be under-represented in our analysis since gloss is often difficult to discern on the local chert. Glossed edges (figure F, G, H, and I) are also occasionally found on unmodified blanks although most of the glossed pieces exhibit truncation on one or both ends and are abruptly retouched. Gloss is generally only on one edge. Such edges may be unmodified, serrated or retouched. Gloss usually extends to the first ridge on the dorsal surface, but on the ventral face it is only visible as a narrow band parallel to the edge of the blank. Occasionally it is more diffuse and slightly oblique to the axis of the edge (figure 16 G).

Piercers (figure 16 L-N). Although a variety of forms have been noted, piercers are identified by a point with abrupt retouch on the end of a blank (figure 16 L and M). Two two-pronged piercers (E2.159.3 and E.159.3 [figure 16 N]) are also present. Two relatively thick, triangular-sectioned objects (possibly perforators) have also been identified. One is a blade with semi-invasive inverse retouch along both edges becoming abrupt at both ends. The other has a flat cortical undersurface which provides a platform for retouch. The retouch is abrupt from both edges meeting at a ridge in the center. The end is pointed and there is no sign of wear.

Scrapers and Denticulates. Artifacts with semi-abrupt retouch on one or more edges forming a regular convex contour are included in the category of scrapers. The retouch may be across the distal end of a flake, on one side or around its perimeter.

Morphologically similar pieces with denticulated edges are described as denticulate scrapers.

Obsidian

The products of both flake and blade production are present in the Ubaid assemblage from Kenan Tepe (table 9b). The blade-based technology consists largely of blade segments and retouched pieces. Only one core fragment (figure 17 C), which is damaged and re-flaked, has been identified. This may imply that the majority of blades at Kenan Tepe were acquired as blades rather than reduced from cores. Flake reduction, on the other hand, appears to have taken place locally. This is evidenced by a number of early stage flakes, sometimes with outer surfaces (Parker *et al*. 2006: 98 and fig. 24 P and Q) and several irregular cores and struck lumps. Two of the more regular flake cores are illustrated (figure 17 A and B). About 16% of the obsidian has been modified in some way, as summarised in table 11. Most samples only exhibit minimal alteration such as regular nibbling retouch along one or both lateral edges (Figure 17 L and M), although occasionally it more extensive. Some of the blades have heavier crushing retouch and more rarely have rounded edges (probably caused by working some hard substances [figure 17 N and O]). More formal tools include two arrowheads, two possible scrapers, a truncated blade, and four Çayönü-type tools. There are a number of splintered pieces (piéces ésquillées) and what appear to be side-blow blade-flakes. In addition there are rim fragments of two obsidian vessels and two flakes of obsidian that have been used to make items of personal adornment.

Trench	Flakes with edge retouch	Blades with edge-retouch	Other retouched pieces	Description
D04	0	14	2	Çayönü tool; Flake with ground edge
D06	0	54	1	Transverse arrowhead,
D05?	4	30	3	blade with retouched notches, point, denticulate
D05	2	42	3	truncated blade, arrowhead (?) , Çayönü tool
D08	2	45	9	Çayönü tool; piece with possible ground edge; 7 indeterminate retouch
D10	0	4	0	
E02	0	23	3	Scraper (?) fragment, 2 x Çayönü tool
Total	*8*	*212*	*21*	

Table 11. Obsidian retouched artifacts.

Arrowheads (figure 17 T). There are several forms among the arrowheads. These include a small stemmed or tanged form (D5.5190.27, Parker *et al.* 2006:99), small transverse shapes (figure 17 T. See also Parker *et al.* 2006 figure 24 D from a late Chalcolithic context) and blades with abrupt retouch on opposite edges forming a tang (figure 17 R and S).

Çayönü-type tools (Figure 17 P and Q). A number of artifacts resembling the form variously described as "Çayönü tools," "strangulations" or "strangulated blades," are present in the Kenan Tepe corpus. These are small blade segments of (usually) green obsidian (about 20-25 millimeters in length, and 10-15 millimeters in width and 4 millimeters thick) with abrupt retouch along both lateral margins and distinctive longitudinal striations on the ventral surface (Nishiaki 2000, Conolly 1999). The presence of Çayönü type tools and the side-blow blade flakes is surprising as they are more usually associated with earlier pottery Neolithic assemblages at sites such as Çayönü, Tell Kashkashok II, and so on (Nishiaki 2000: 211-12).

Piéces ésquillées (figure 17 D-G). Particularly noteworthy are the high number of splintered pieces (or piéces ésquillées). There are two distinct forms among this category: those which have a characteristic wedge-shaped section with flaking and crushing on the thicker end (figure 17 D and E), and blades which have a longitudinal removal along the ventral surface and splintering at either end (figure 17 F and G). The function of these artifacts remains enigmatic although it has been suggested that they result from reduction on an anvil (the technique is thought to cause the object to appear to have been flaked from both ends), or that they were used as wedges in working wood or bone (Ataman 1989: 208-210; Conolly 1999: 43-47; 2003: 367). Piéces ésquilleés have a wider chronological distribution than the Çayönü tools occurring from the Neolithic through to Uruk contexts (Conolly 2003). They have been documented in Ubaid contexts at Kurdu, Norşuntepe, Kenan Tepe, and Kosak Shamali among others (Healey forthcoming).

Side-blow blade-flakes (figure 17 H-K). These are classic products of the segmenting of obsidian blades by a blow on the dorsal surface. The residual 'cores' (i.e.; the blades from which the segment was struck) are also present (figure 17 H and I). The method and reason for the production of side-blow is disputed (Nishiaki 2000, 199-205).

Other Artifacts. The Kenan Tepe corpus includes two fragments of obsidian vessels manufactured from cloudy grey obsidian (D8.55.3 and D5.5066.5419), an obsidian bead (Parker and Dodd 2005:72), an obsidian button or pendant and a small obsidian disc. The button or pendent (D8.143.6) is made of a flake of smoky grey obsidian. It is chipped and its edges are ground and perforated. The disc is a flake of green obsidian that has been chipped to a sub-circular shape and its edges ground (D6.168.18).

Conclusion

The lithics from Ubaid contexts at Kenan Tepe are comparable to those from other Ubaid sites, although these, with a few notable exceptions, are poorly understood (Healey forthcoming). The presence of Çayönü-type tools and side-blow blade-flakes is however surprising as they are normally associated with earlier contexts (Nishiaki 2000), a situation that clearly requires further research. The importance of the Ubaid lithic assemblage from Kenan Tepe cannot be overemphasised, not only because it is a substantial and well contexted assemblage, but also because lithic assemblages and their production technologies are integral to understanding the socio-economic organisation of prehistoric societies (see for example Edmonds 1995, Lemonnier 1993; Johnson 1996;

Nassaney 1996). The integration of the micro-samples with the macro lithics should prove useful in this respect. A full discussion of the Kenan Tepe's lithic assemblage is currently in preparation and thus a more nuanced interpretation of these data must await the final publication.

SMALL FINDS

Introduction

The purpose of this section is to introduce the most recently recovered small finds in relation to the larger categories of use and meaning within which they may have existed in the past. Many of the small finds discussed here were recovered from contexts within, around and nearby *Ubaid Structure 4* (discussed above). The second period of interest examined in this section is the Middle Bronze Age. While not the primary focus of the 2007 excavation season, this occupation phase lies directly on top of the Ubaid occupation in Area D and thus a number of interesting artifacts were recovered during the course of the excavations. The four categories of artifacts discussed here are food preparation, production, ornamentation and cognitive materials.

Food Preparation and Storage

While pottery tends to be the main artifact type associated with food preparation, cooking requires more than pots. Another important artifact type for these activities is the andiron or pot stand. Support for vessels placed within or near cooking fires is an important function, one that was not always handled with the expedient use of available stones. Andirons, or low-fired ceramic artifacts used within or near to fires for the support of cooking vessels, have a long history at Kenan Tepe, and examples were recovered from both Ubaid and Middle Bronze Age period contexts during the 2007 field season. These artifacts range from simple pillars to incised and decorated pieces.

Two andirons were recovered from Ubaid period contexts. The first example (D.4.4113.5) is a conical andiron that was recovered fully intact in the collapse of *Ubaid Structure 4*. The top of this artifact is oval in shape and ranges in diameter from 5.5-7 centimeters. Its surface is bumpy and irregular and likely required other andirons working in concert with it to support a vessel or other object securely. The andiron base is also ovoid, ranging in diameter from 12.5-16 centimeters. It is 15.5 centimeters in height. It is composed of chaffy clay with little evident mineral temper. Evidence of the function of this artifact as an andiron or pot stand is seen in sooting on one side.

The second andiron did not survive intact, but as a small fragment of its original shape. D.6.147.8 was recovered from fireplace associated with *Ubaid Structure 4*, and is composed of clay with large pebble inclusions. There is some evidence of sooting on the exterior surface. The fragment measures 8.1 centimeters in height. Its width ranges from 6.8-5.4 centimeters.

Seven andirons or groupings of andiron fragments were recovered from Middle Bronze Age contexts. The first group of fragments included in this report was associated with Middle Bronze Age contexts. D.6.58.22 is a collection of andiron fragments excavated from a Middle Bronze age street. They were too fragmentary to measure, but weighed 330 grams in total. The andiron was probably not kiln fired before use and lacked any evidence of sooting on the exterior. Two other Middle Bronze Age andiron fragments were recovered one from the same locus (D.6.58.16) and one from erosional fill (D.6.99.1). D.6.85.9 is composed of low-fired clay. It is column-shaped flaring wider at the base or top. It is 7 centimeters long. The center is 4.7 centimeters wide and flairs to 8.4 centimeters at its widest point. It weighs 290 grams. The last andiron or pot stand in this group, D.4.4097.6, is from a cleaning locus. This artifact has abundant fine to large chaff temper with equally abundant very fine to medium white, grey and quartz grit. It is L-shaped. Though the andiron was low-fired, it is unclear if it was used in conjunction with fire or if it served as a pot stand. It is 10.8 centimeters long, 9.5 centimeters wide, 1.7 centimeters thick at its top, and 2.9 centimeters thick at its bottom. It weighs 360 grams. It has an interior fabric is light red (2.5YR 6/8). C.1.1110.10 is low-unfired and its original shape is indeterminable, although one side shows evidence of sooting. It has abundant fine chaff temper with moderate fine, white and grey grit. This andiron measures 7.2 centimeters in length, 5.7 centimeters in width and is 4.4 centimeters thick. It weighs 180 grams. The exterior surface is light gray (10YR7/1) the interior fabric is brown (7.5YR 5/4). D.4.4086.23 is a fragment with evidence of minor burning. It is 6.6 centimeters long, 5 centimeters wide, 5.3 centimeters thick and weighs 140 grams. Its exterior surface is light brownish gray (10YR 6/2). D.4.4070.15 is another collection of andiron fragments from a Middle Bronze Age feature. Although the fragments cannot be reassembled, we believe that they belong to the same artifact. The fabric of this artifact contains abundant chaff and fine white grit. The stand is bell-shaped in cross-section and is sooted on one side. The andiron measures 11.3 centimeters in length, 12.5 centimeters in width. It is 3 centimeters thick at its top and 7.5 centimeters thick at its widest point. It weighs 1.82 kilograms.

Andiron D.6.37.20 is decorated with incised lines, dots, or holes that set it apart from the other Middle Bronze Age andirons discussed so far. It was excavated from a cleaning locus. The decorations begin at the corner as two parallel lines with three dots spaced between them. A third perpendicular line joins the first two to continue the pattern up and in the opposite direction. It is possible that this decoration encircled the artifact. The andiron is low-fired and does not show traces of soot. It measures 5 centimeters in length, 5.6 centimeters in width and is 4.65 centimeters thick. It weighs 95.5 grams.

D.4.4070.32.1 and D.4.4070.32.2 are andiron fragments from a feature dated to the Middle Bronze Age. D.4.4070.32.1 is a basal fragment. Only the bend from lower body wall to base is preserved. It is 5.5 centimeters long, 5.6 centimeters wide, 4.7 centimeters thick, and has a weight of 75.75 grams. The second fragment, D.4.4070.32.2, survived only as a perforated edge of an andiron. There is no evidence that these two fragments belong to the same object. The edge fragment retained three vertical holes as decoration, and survived to 5.3 centimeters in length, 2.2 centimeters in width, and 2.6 centimeters in thickness.

While both ceramic vessels and lined pits or bins played an important role in storage, other perishable objects, such as baskets and leather bags were probably also widely used for this purpose. One way that evidence of basketry or other perishable materials can be seen archaeologically is through the preservation of pieces of clay retaining the impressions of such materials. In some cases clay was used to seal containers or doors. These sealings may or may not have impressions of seals stamped into or rolled over their exterior surfaces, but their interior surfaces usually have impressions of this type of perishable material.

One such sealing used to close a basket was found at Kenan Tepe. Excavated from an Ubaid context associated with *Ubaid Structure 4*, D.6.174.8 retains clear impressions of wicker coils and thus must have been used to seal or somehow secure a coiled basket or container. The container was constructed from coils of a thin organic material wrapped tightly around a central core. The impression records five of these coils built on top of each other. The sealing itself is highly friable and appears to have been roughly applied to the container (figure 18 I). Owing to the uneven surface of the unimpressed side it is unclear if the exterior surface survived deposition. The sealing measures 6.2 centimeters in length by 5.3 centimeters in width. It is 2.75 centimeters thick. The impression survived to 4.2 by 4 centimeters with an average coil height of 0.6 centimeters each.

Production

Production-related artifacts are those whose function relates to the production or manufacture of durable goods or consumables. While many types of materials (textiles and basketry for example), do not usually survive in the archaeological record, some of the tools used to create them often do. In relation to textile production, artifacts, such as spindle whorls for the production of fiber strands and loom weights used to anchor thread or yarn on a loom are the most common. Another category of production related artifacts found at Kenan Tepe are those used for cutting, drilling and scraping.

The Ubaid village at Kenan Tepe has shown an impressive focus on textile manufacturing with many spindle whorls and loom weights recovered throughout the excavation seasons (Parker, *et al*., 2006, 2008). During the 2007 season UTARP team members recovered substantial evidence of textile manufacture adding a bone needle, a spindle whorl, 25 loom weights, 12 loom weight blanks and 3 bone awls to the already existing Ubaid period and Middle Bronze Age assemblages. The bone needle (D.4.4134.8) was broken in antiquity and only survived as 5.4 centimeters of the top portion (figure 18 A). The sharp point was not recovered. While the top portion of the needle was damaged, it begins to taper inwards from the main shaft and the eyelet remains intact. The eyelet measures 0.2 centimeters in exterior drill diameter and 0.1 centimeters in interior drill diameter. The shaft of the needle itself is cylindrical in shape, ranging in diameter from 0.4-0.35 centimeters. The entire surface has been worn to a high shine. It is unclear how long the extant version would have been as the basal portion was not recovered and the needle shaft had not yet started to taper towards the sharpened tip.

Spindle whorl D.8.161.5 was also broken in antiquity. It is undecorated and conical in cross section with a burnished exterior surface. The whorl itself is burnt, but it

is unclear if it was originally this color or if it was burned in a fire. This is not a finely created spindle whorl and the base is roughly shaped. The artifact survived to a length of 3.3 centimeters by 2.7 centimeters in width and 2 centimeters in height. The interior diameter for suspension survived to 0.7 centimeters.

Many of the loom weights recovered from Kenan Tepe are ceramic sherds that have been chipped and ground into circular, semi-circular or rectilinear shapes and then drilled, either biconically or from one side for suspension. In some cases the sherds retain exterior painted designs, but these are remnants of the original vessel painting rather than the tools being painted on their own merits. The perforations are often worn smooth from suspension, and many were broken either in use or in antiquity.

Thirteen such loom weights were recovered from Ubaid period contexts, with an additional nine from Middle Bronze Age contexts. Owing to the relatively uniform nature of the loom weights in terms of physical characteristics, they are listed here (table 12) in tabular form for reference. While a great majority of the disks are described as circular, owing to the fragmentary nature of some of the finds, the length and width may look incongruous.

KT#	Shape	Length (cm)	Width (cm)	Thickness (cm)	Weight (g)
Ubaid					
D.4.4115.10	Circular	3.0	1.7	0.7	3.0
D.4.4085.23	Circular	7.4	3.8	1.5	35.6
D.4.4085.25	Square	7.3	7.0	1.6	90.0
D.4.4086.22	Square	4.8	4.9	1.7	40.0
D.6.167.66	Circular	2.4	2.0	0.8	3.7
D.6.188.1	Circular	4.8	2.6	0.9	10.4
D.6.188.20	Circular	3.6	2.2	1.0	5.6
D.8.138.15	Circular	2.6	2.7	0.6	4.8
D.8.148.16	Circular	8.0	8.1	1.8	90.0
D.8.161.21	Circular	5.5	5.1	1.6	40.0
E.2.160.10	Circular	4.6	4.7	0.9	23.1
E.2.166.11	Circular	3.5	3.5	1.1	13.7
E.2.182.2	Circular	3.5	3.4	0.6	8.2
Middle Bronze Age					
C.1.1110.8	Circular	3.5	3.6	0.8	12.7
D.4.4003.4214	Circular	6.3	6.3	1.8	74.6
D.4.4071.7	Ovoid	8.5	5.0	2.5	80.0
D.6.17.38	Circular	8.0	6.1	1.7	88.7
D.6.37.21	Circular	7.8	4.5	1.7	60.0
D.6.64.11	Circular	7.9	4.8	1.6	53.1
D.6.64.13	Circular	8.0	4.8	1.7	65.0
D.6.72.23	Circular	5.8	3.3	1.2	22.4
D.6.85.2	Circular	3.5	3.0	0.8	10.5

Table 12. Perforated loom weights from Ubaid and Middle Bronze Age (MBA) contexts.

A number of potential loom weight blanks were also recovered from both Ubaid period and Middle Bronze Age contexts (figure 18 F and table 13). The disks were all chipped and ground to shape, and in two cases were partially drilled (D.8.132.30 and D.6.168.23). D.8.132.30 is an example of a failed attempt at perforation showing that drilling was attempted four times with two drilled cavities on each surface. Two of the cavities on the exterior and interior surfaces line up and almost meet through the core of the artifact, but the perforation was not completed. An interesting feature of this sherd disk is that the interior surface is coated with a black paint or bitumen, and the drill marks pierce through that material. The disk itself is ovoid in shape with a length of 6.9 centimeters and width of 3.9 centimeters. The disk thickness is 0.9 centimeters. The drilled cavities range in diameter from 0.2-0.7 centimeters, and in depth from 0.1-0.5 centimeters. D.6.168.23 is also a disk that was initially drilled, but the activity was not completed. Based on the breakage pattern, it is possible that it broke during manufacture. While most of the sherd disks are circular in shape, D.4.4115.7 and D.6.98.2 are ovoid. There is appreciable variation in the range of disk sizes. The smaller disks were likely meant to act as loom weights. The larger examples may have been used as spindle whorls. A second possibility is that the unpierced sherd disks functioned as mneumonic devices. Kielt-Costello (Bernbeck 2003:51; Kielt-Costello 2000, 2002) suggests that with the rich history of objects for mneumonic or memory devices in the ancient Near East, sherd disks such as those found at Kenan Tepe could have served similar memory-aid functions. This interpretation of the artifacts is based on their contexts of discovery. Further research would be required to test this hypothesis on the Kenan Tepe material.

KT#	Shape	Length (cm)	Width (cm)	Thickness (cm)	Weight (g)
Ubaid					
D.4.4115.7	Oval	6.2	4.3	0.7	22.25
D.6.102.10	Circular	5.0	5.2	1.5	46.6
D.6.102.4	Circular	4.2	4.5	1.5	29.7
D.6.111.1	Circular	3.3	3.45	1.0	10.0
D.6.113.1	Circular	5.4	5.5	1.2	38.2
D.6.114.9	Circular	7.5	7.7	0.9	63.2
D.6.163.5	Circular	4.8	4.0	0.5	9.25
D.6.168.23	Circular	5.5	2.7	1	16.4
MBA					
C.1.1109.18	Circular	4.0	3.5	1.0	14.8
C.1.1110.8	Circular	3.5	3.6	0.8	12.7
C.1.1117.20	Circular	6.0	6.4	2.35	106.7
D.6.32.1	Circular	3.0	2.8	0.8	9.4
D.6.98.1	Circular	3.0	2.8	0.8	7.4
D.6.98.2	Ovoid	4.2	3.7	1.0	18.2

Table 13. Loom weight blanks from Ubaid and Middle Bronze Age (MBA) contexts.

Drilled stone weights potentially used as loom weights were also recovered from Ubaid period contexts (figure 18 D). D.8.148.21 is a drilled pebble weighing 59.7 g and 3.4 in length by 4.6 centimeters in width and 3.1 centimeters in thickness. The material may be gneiss, as a predominately white, heavy stone with swirls of black throughout. The pebble may have had an irregular, convex surface that lent itself well to being drilled for this type of usage. The interior of the drill hole, measuring one centimeter in diameter, is shiny from either production or suspension wear.

The second drilled stone weight (D.8.148.28) is also a pebble, but this one is a deep reddish purple. It was likely a river stone whose shape lent itself to be drilled for this use as a weight. This artifact is broken roughly in half, surviving to a height of 1.5 centimeters with a width of 3.8 centimeters and a broken depth of 1.5 centimeters. The surviving portion of this artifact weighs 12.8 grams. The drill hole is 1.2 centimeters in diameter. The interior of the drill hole has sheen likely resulting from suspension.

The final stone weight (D.4.4113.31) was carefully shaped and drilled with a well-ground and rounded exterior surface. Only half of the artifact survived, broken from one side of the drilled hole to the other. The stone material is black with stripes of white quartz. There is some sheen to the exterior drill hole circumference, potentially resulting from suspension. The artifact survived to 3.8 centimeters in length, 2.35 centimeters in width and 2.6 centimeters in maximum thickness. The interior hole diameter was 1 centimeters and it weighed 25.55 grams.

The second category of production-related artifacts recovered from Kenan Tepe include those functioning as cutting, drilling and scraping tools. The most prolific of these tool types at Kenan Tepe are bone awls. Other tools recovered from the 2007 excavation season include a sherd scraper, two retouched obsidian flakes and a metal blade fragment.

The bone awls from Kenan Tepe are constructed from what may be artiodactyle metatarsals or metacarpals, incorporating intact condyles at the top of the artifact that then taper down the shaft until it is ground and shaped into a very sharp tip. These artifacts could have been used as drills or piercing tools for soft materials, such as leather, textiles and wood.

The first two bone awls, D.6.114.5 and D.6.114.6, were both recovered from a fill locus that abuts an Ubaid wall. D.6.114.5 was broken on the condyle and point ends in antiquity, as the breaks are accreted. The shaft and cut edges of the body show sheen from usage. The bone was 0.2 centimeters in thickness suggesting that this artifact was created from a larger metatarsal than the other awls recorded to this point. The larger size would have subsequently created a larger hole as well as thus this tool probably served a slightly different function than similar tools in the corpus. The tip comes to an acute point, but it is slightly blunted either from deposition or usage. It is 9.7 centimeters long and 1.1 centimeters wide, with a maximum thickness of 0.7 centimeters (Tobler 1950:Pl. XCVIII and XCIX). D.6.114.6 still retained a relatively sharp tip, although it has a recent break. The blunt edge retains some cancellous or trabecular bone and the shaft is hollow, so this was potentially created from a metatarsal with the condyle missing. The ground point is well worn, indicating heavy usage on some relatively soft or resilient material. The sharp

point would not have survived being used on a material harder than itself. This awl is 6.7 centimeters long and 0.9 centimeters wide (Tobler 1950:Pl. XCVIII and XCIX).

Bone awl D.6.182.5 came from an Ubaid wall, was well-used and relatively short in length. The condyle was heavily damaged and the awl itself is relatively flat in cross-section from wear. The tip was damaged during excavation, so the extant sharpness is difficult to determine. It appears to have been broken or re-sharpened in antiquity as the long ends are sharp whereas other examples are worn smooth with a sheen. The awl is 6.6 centimeters long, 1.4 – 0.5 centimeters wide and 0.3 centimeters thick. The last awl, D.6.164.8 was recovered from Ubaid fill. It has a fresh break and was separated from its sharp tip. Only the articular facet or condyle remains. The split in the bone is shiny and worn from usage (Tobler 1950:Pl. XCIX).

One worked sherd scraper (D.4.4112.42) was also recovered from an Ubaid period context. The sherd was chipped and ground into a thin scraper measuring 5.3 centimeters in length, 3.2 centimeters in width and .4 centimeters in thickness. The object weighs 8.55 grams. The sharp edges were chipped to sharpen and strengthen the surface. The exterior sherd surface retains a painted horizontal band across its length from the initial decoration of the vessel. It is unclear if the painted design covered the entire scraper or not, as a majority of it is worn off. The interior surface is worn and softened from usage. The paint on the exterior edge of the sharp, scraping surface is barely worn, while the interior surface is worn and rounded. Therefore the wear seems to primarily be focused on the interior sharp surface. It is possible that the scraper was used with the exterior ceramic surface pointing upwards, rubbing or scraping the interior surface of the sharpened edge along animal hides or soft woods, thus resulting in this pattern of wear.

Cutting implements recovered from Kenan Tepe include both stone (see above) and metal tools. Two bronze blade fragments were recovered from Middle Bronze Age contexts. D.6.111.5 is badly corroded and little of the original shape preserved. This artifact is wedge-shaped in profile, suggesting it was originally a blade. It survived to a length of 1.8 centimeters, a width of 1.3 centimeters and a thickness of 0.2 centimeters. D.4.4097.5 is a bronze blade or a possible point from a Middle Bronze Age cleaning locus (figure 18 B). Due to corrosion, it is unclear if there were any markings or decorations on the artifact's surface. It is presently 8.6 centimeters long, but its approximate unbent length would have been 10 centimeters.

Ornamentation

Ornaments form another important category of artifacts in Kenan Tepe's corpus of small finds. We define ornaments as artifacts used for the decoration of clothing or the creation of jewelry. Since textiles are usually not preserved at Kenan Tepe, it is difficult to say how certain items, such as metal pins, were utilized. Jewelry is equally difficult to reconstruct. However, the importance of ornamental artifacts is evidenced by the many types of materials utilized including bone, shell, stone, ceramic and metal, in their method of manufacture, and the amount and variation in the types of artifacts created.

D.8.143.6 is likely a pendant or some form of suspended ornament. It is composed of a small piece of chipped and ground obsidian measuring 1.4 centimeters in length by 1.8 centimeters in width. It is 0.4 centimeters thick. When held up to the light, the color of the obsidian is a dark to light grey (see above).

Two shell ornaments, both from Ubaid period contexts, were also recovered. The first (D.6.167.6) was broken in antiquity (figure 18 G). It currently measures 1.5 centimeters in length by 2.5 centimeters in width with a thickness ranging from 0.1-0.2 centimeters. The artifact was biconically drilled in two places, with a drilling mark still visible on the obverse. The first perforation is located 0.7 x 0.6 centimeters from the edge of the shell, with the second perforation 1.2 centimeters directly to the right of the original hole. No wear to the perforations is evident. The shell is dark grey in color and lacks any evident sheen. The multiple perforations could indicate that the shell was to be divided into two or more beads or buttons, but that this particular example was never completed.

The second shell ornament (E.2.185.4) was probably also a bead or button. The top portion of this artifact has been shaped into a semicircular arc. It measured 1.9 centimeters in both length and width and has a thickness of 0.1-0.2 centimeters. It was drilled from one side and in one place only. Striations from the drilling are still visible on the outside of the shell.

Three stone pendants were recovered from Ubaid period contexts. The first pendant (D.6.167.4) was carved and ground from a very lightweight, white stone with thin swirls of black throughout (figure 18 H). The pendant tapers from a square cross-section arm downwards to a sharp bend. At this point it looks as if the pendant shape would have continued around in an incomplete circle, potentially forming a fish hook-like shape. However, the rest of the pendant was lost and exact shape cannot be known. The stone's surface is very soft, retaining the striations from production. The artifact survived to a height of 4 centimeters. It is 0.7 centimeters wide and 0.6 centimeters thick.

Stone pendant D.6.167.27, which was discovered in the same context as D.6.617.4, is a very fine grained, white stone with a high polish over its entire surface. The top of the stone was perforated biconically for suspension. The stone is slightly concave on both faces, with the top and bottom well-rounded and smooth. The pendant measures at 1.2 centimeters in length by 0.8 centimeters in width and 0.5 centimeters in thickness.

The final Ubaid stone pendant discussed here is D.6.168.2, a pinkish-colored drilled stone ornament. The only modification of this pendant is the drill hole. The perforation was made from one side, with the reverse side of the hole smoothed afterwards. The hole was drilled at an angle, leaving an oval-shaped opening with one side lower on the front and higher on the back. There are no evident wear marks. The artifact measures 4.7 centimeters long by 2.8 centimeters wide. It is 0.4 centimeters thick.

The last three Ubaid period ornaments recovered are beads, two made of stone and one of ceramic. D.6.186.4 is a drilled black stone bead. Although this artifact is broken, we theorize that it was originally bent or curve-shaped. One edge is smooth like the rest of the bead, and comes to a sharp point, like a horn. The broken edge curves in, but would likely have either ended or curved upwards. This bead is 1.5 centimeters long by 1.3 centimeters wide. It is 0.7 centimeters thick.

The second stone bead (D.6.145.1) appears to have been crafted from a white calcareous material. It was found in association with an Ubaid child/infant burial (see above). This bead is barrel-shaped in cross-section with a perforation running from one narrow end to the other. No measurements were possible.

The final bead recovered was of ceramic material (D.6.178.8, figure 18 D). The shape of the bead was a circular lozenge center tapering to each end. The bead was perforated from tip to tip, but only survived as one half (across the horizontal axis) of its original shape. The exterior of the bead is slipped in dark brown (5YR2.5/2 [dark reddish brown]) and burnished horizontally. The bead's length is 2.5 centimeters by a width of 2.4 centimeters at its widest and 1.7 centimeters at the taper. The thickness of the bead varies from .8 centimeters at its widest to 0.6 centimeters at the taper.

Five ring-shaped artifacts were recovered from Ubaid period contexts, one of bone, two of ceramic and two of stone. The first is a small, wide bone ring (D.6.188.5). The ring appears to have been cut and polished from a faunal long bone based on material texture. The color ranges across the yellowish-red spectrum (Munsell ranges from 7.5YR7/8 [reddish yellow] to 5YR5/8 [yellowish red]). The exterior surface of the ring is highly polished, though the interior cannot be seen clearly owing to accretions. The interior width of the ring ranges from 1.3-1.1 centimeters in diameter, with an exterior diameter of 2 centimeters. This would have been a very small ring to wear on a finger, but it could have been worn in the hair or suspended as some other form of adornment or ornament.

The two ceramic ring-shaped ornaments found are not perforated sherd disks, but instead were initially shaped into curved or circular shapes. Neither one survived in its original shape. D.8.132.12 survived as half of a ceramic ring. The length of the artifact is 3.4 centimeters with a width of 1.7 centimeters and a thickness of 0.85 centimeters. The interior diameter of the artifact is 1.5 centimeters.

The second ceramic ring recovered is D.8.131.6. While similar in shape to the first example, this broken ceramic ring is not as finely formed. The shape is more abrupt, without the smooth curing of the aforementioned object. The rough surface has a similar appearance to a perforated sherd disk, but this is all one surface rather than being an exterior and interior surface with exposed core. The ring survived to a length of 2.7 centimeters with a width of 1.6 centimeters and a thickness of 0.7 centimeters. The interior diameter of the ring is 1 centimeter.

The final two ring-shaped artifacts to be discussed are both created from stone. A black stone ring (D.8.134.25) survived to less than half of its original size. The stone, similar to the above mentioned broken stone bead, is very lightweight and feels almost plastic to the touch. The ring is conical in shape with a slight concave bend in the middle of the body. The exterior surface is lustrous with some sheen to the interior. Fine, parallel, horizontal striations mark the exterior surface. The ring survived to 2 centimeters in length with a width of 2.3 centimeters and a thickness of 0.4 centimeters. The interior perforation diameter is 3 centimeters.

The second example of a stone ring, D.8.145.21, may have in fact been a perforated stone pendant, but all that remains is the perforation and some of the surrounding stone creating a ring-like shape. The surviving surface of the artifact has a

slight sheen. It survived to a length of 2.75 centimeters with a width of 1.4 centimeters and a thickness of .7 centimeters. Interior perforation diameter was unable to be measured owing to damage to the artifact.

The last three ornaments to be discussed here are three bronze or copper pins. Two are from Middle Bronze Age contexts and one is from mixed fill. D.6.83.3 is a bent metal pin that would have originally measured to roughly 12 centimeters in length (figure 18 C). The average body diameter is 0.2 centimeters. The pin was recovered from a mixed cleaning locus, but is likely Middle Bronze Age in date.

Three pieces of the second pin (D.6.102.5) were recovered from a Middle Bronze Age surface. All three pieces were highly corroded with green-blue accretions. The total length measures to at least 4.7 centimeters with a body diameter of 0.2 centimeters.

Finally, C.2.2082.2547 was recovered from a Middle Bronze Age pit, and only survived as one small piece of the original whole. The artifact was highly corroded, and original shape is difficult to determine. It survived to a length of 2 centimeters by a width of .3 centimeters and a thickness of .3 centimeters.

Cognitive Artifacts

Here we use the phrase "cognitive artifacts" to refer to artifacts that do not serve an obvious function but instead may have had some sort of symbolic, ritual or ideological significance. Such artifacts tend to be manufactured in visually striking ways.[25] We attribute four Ubaid period artifacts to this category: three incised bone objects and a partial ceramic figurine. Three fragmentary animal figurines were also recovered from Middle Bronze Age contexts. This adds to the already extensive corpus of Middle Bronze Age figurines previously published (Parker, *et al*. 2008: 147-149 and figure 27).

Two of the three Ubaid period incised bone artifacts were burned to a blue-grey color (GLEY1 5N [Grey]) prior to deposition. D.6.167.17 is only partially complete. Based on size and shape of the artifact it was most likely shaped from an animal metatarsal or metacarpal, with the articular ends carved and shaped. The artifact measures 3.2 centimeters in length although a similar artifact in the Diyarbakır museum suggests that it was originally much longer. The width of the artifact varies from 2.3 to 1.6 centimeters. It is 1.5 to 0.8 centimeters thick.

A second fragment (D.6.167.3) of a burned, incised bone artifact was recovered from the same context. It is unclear if this represents a fragment of D.6.167.17, or if it belongs to a similar but separate object. The bone has a similar blue-grey sheen and exhibits some diagonal incisions. The surface of this artifact is finely smoothed or perhaps polished. Fine striations travel up and down the shaft. This example measures 6.8 centimeters in length and is 0.9 centimeters wide. It is 0.5 centimeters thick.

The third incised bone artifact (D.6.182.4) is dark brown (7.5YR4/6 [strong brown]) with a polished exterior surface (figure 18 E). Although the complete design is

[25] We acknowledge that there may be an overlap between our ornamental artifacts and our cognitive artifacts.

not preserved, the incisions originally radiated from the center of the artifact and then move outwards toward and around the edges. The artifact measures 6.7 centimeters in length. It is 1.4 centimeters in width at the base and 1 centimeters in width at the middle of the shaft. The average thickness of the artifact is 0.8 centimeters.

The one example of an Ubaid period figurine found from this season is D.8.132.43, an incised clay "horn" figurine (figure 18 J). The base of the figurine is broken along its entire length, suggesting that this is all that remains of a larger figurine. The extant fragment resembles a curved bovine horn. Diagonal incisions are patterned across the top of the artifact and the exterior is a burnished brown (2.5/4 YR [dark reddish brown). The artifact measures 6.6 centimeters in length and 1.6 centimeters in width. It is 1 centimeter thick at its base.

The last artifacts discussed here are three fragmentary animal figurines from Middle Bronze Age contexts. The first example, D.4.4097.3, is a ceramic figurine fragment of an animal torso. The body is broken at the neck, at the mid-body and at each of the two front legs. There is fugitive paint on the inside of the front left leg. The paint begins in a thin line higher up on the neck and descends between the front legs, wrapping around the left leg and disappearing at the underside of the body. This figurine measures 5.3 centimeters in length and is 4.3 centimeters wide. It is 3.7 centimeters thick. The exterior of the figurine was a light brownish grey (10YR6/2 [light brownish grey]) with dark brown (10YR2/2 [very dark brown]) paint.

The two remaining figurine fragments were recovered from the same context. D.6.102.8 again is a fragment of an animal body. This fragment consists of a torso broken at the neck and at the legs. This fragment measures 6.1 centimeters in length and is 3.5 centimeters wide. It is 2.95 centimeters thick. The second figurine fragment from this context is D.6.102.9. This artifact is severely damaged both through breakage and as a result of burning. The fragment preserved is the rear portion of an animal with evidence of a tail and broken stubs where the two rear legs would have protruded. It measures 3.9 centimeters in length and 4.3 centimeters in width. It is 2.8 centimeters thick.

In summary, the small finds recovered from the 2007 excavation at Kenan Tepe cover a broad range of artifacts from the mundane to the cognitive. While production and other forms of manufacture were an important focus for the community, items of adornment and potential cognitive or mneumonic importance were also carefully crafted.

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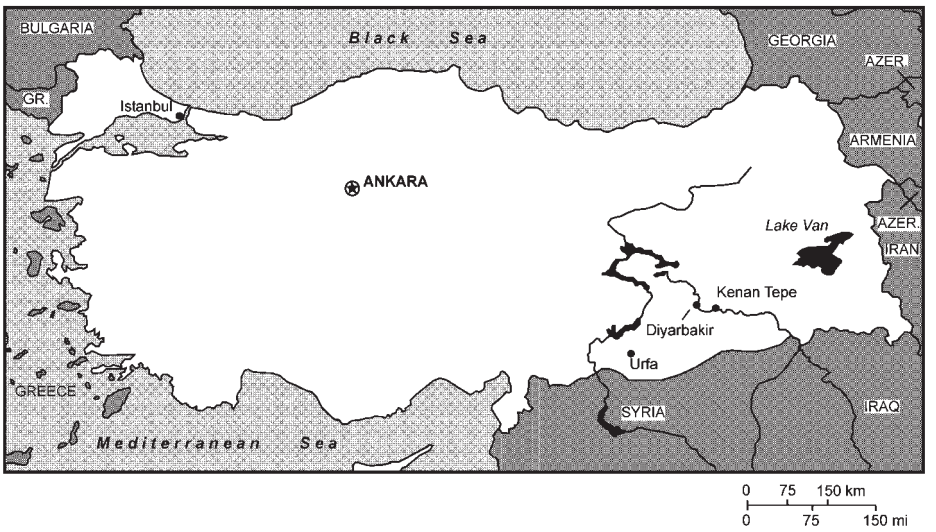

Fig. 1. Map of Turkey showing the location of Kenan Tepe on the Upper Tigris River, and nearby modern settlements.

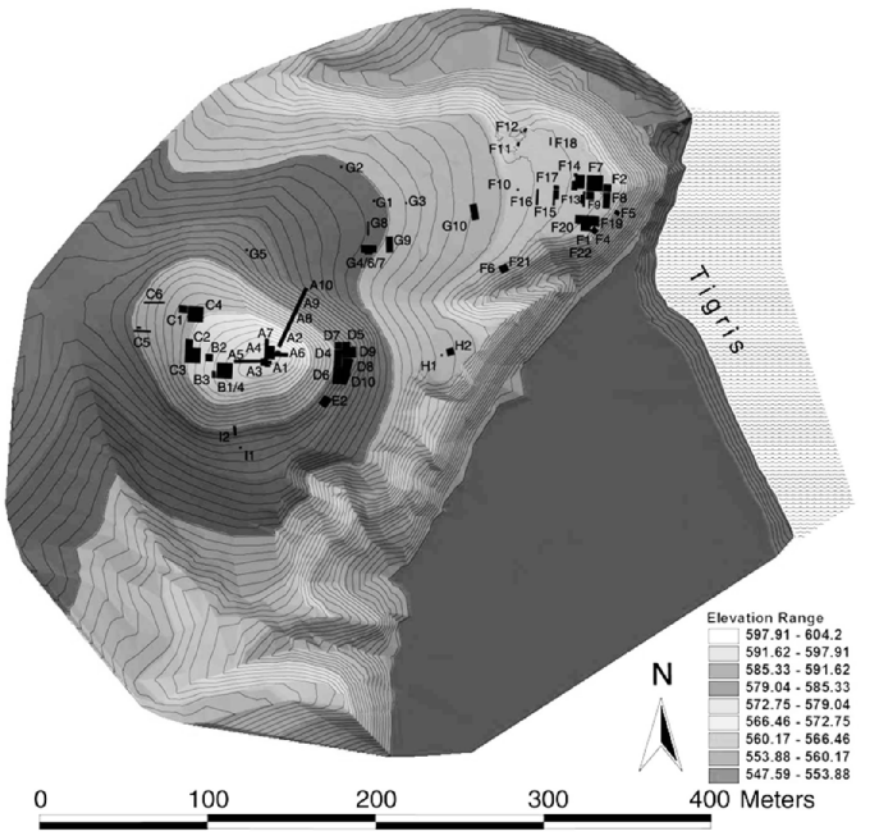

Fig. 2. Topographic map of Kenan Tepe showing the location of excavation areas and trenches.

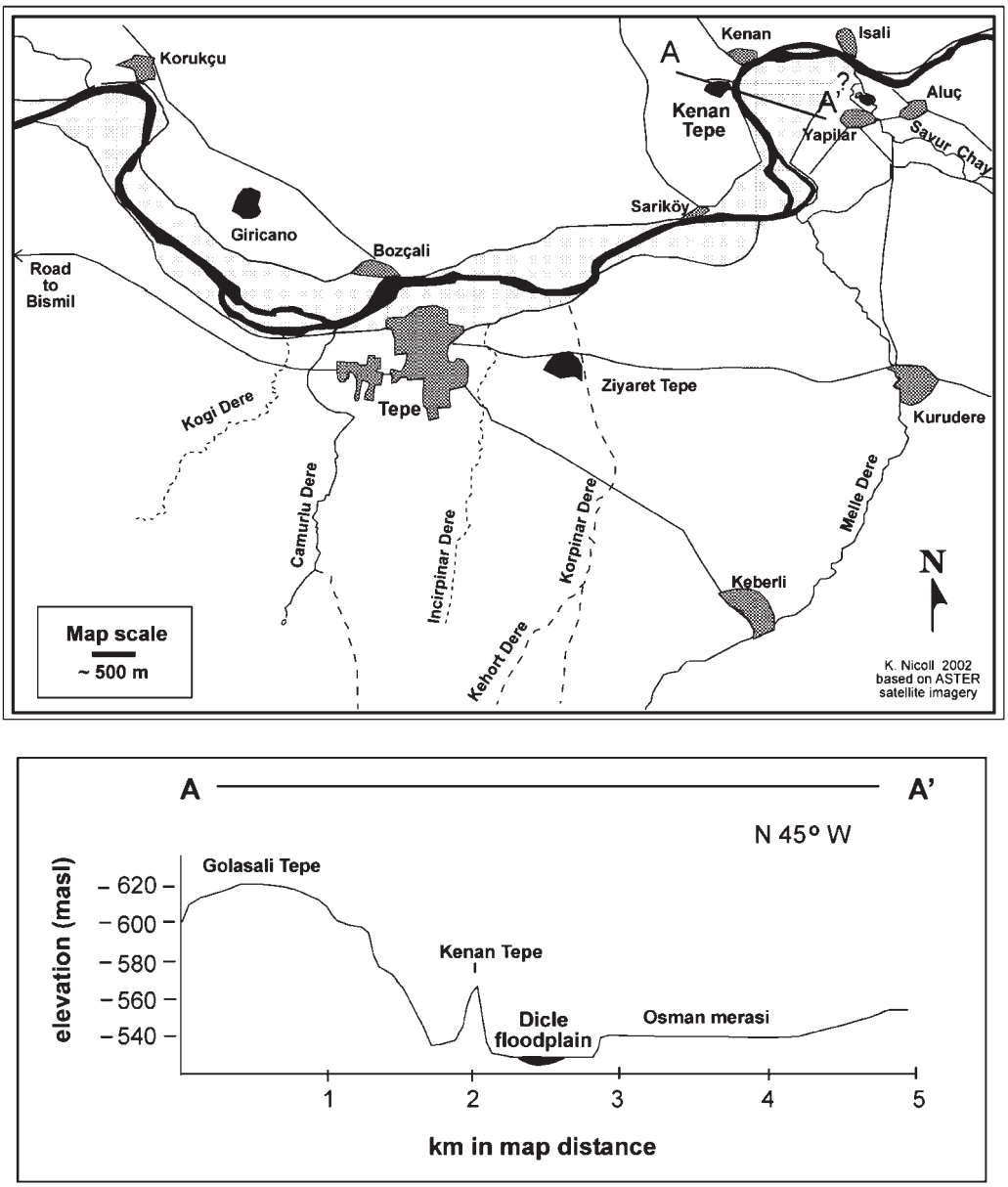

Fig. 3. (Top) Recent river deposits (denoted in light grey) mapped in the Tigris River valley *via* analysis of satellite imagery. The position of villages and local archaeological sites relations are denoted. (Bottom) Cross-section along A-A' transect bearing N 45° W, depicting topographic relief and relationships of the primary landforms near Kenan Tepe, as interpreted from topographic maps archived by TAÇDAM. The factor of vertical exaggeration is approximately 13.

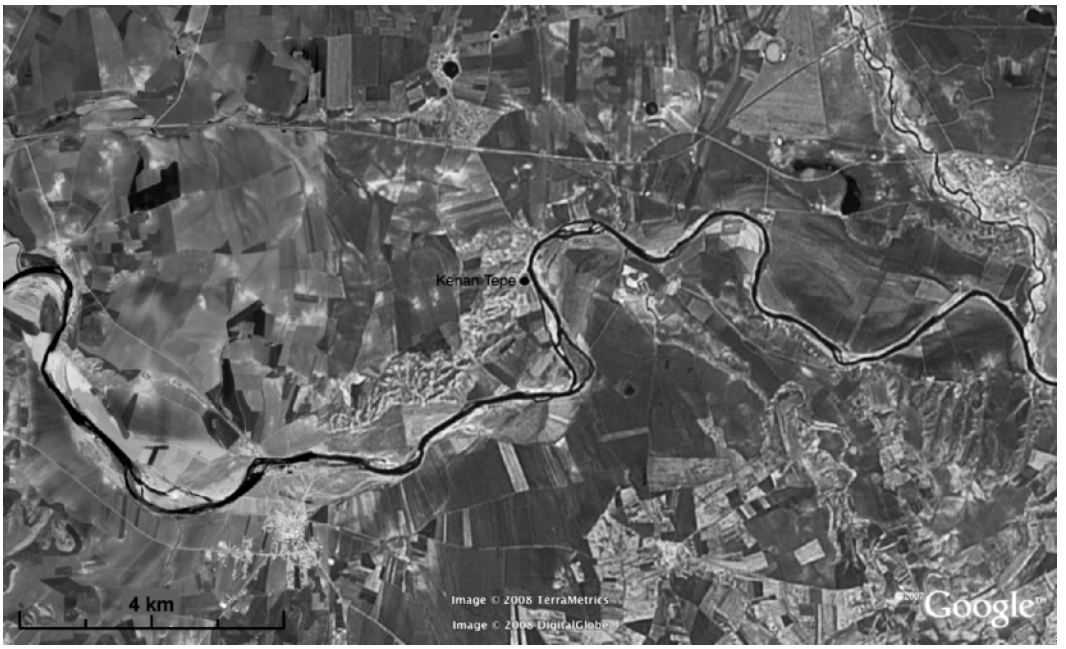

Fig. 4. Google Earth image showing the landscape setting near Kenan Tepe, located ~37° 49'46.44" N, 40° 48'56.46" E (datum = WGS 1980). The river displays a meandering morphology, with sinuous channels and scroll bars evident. Near Kenan Tepe the river transitions towards more of an anastomosing system that flows around channel islands and bars up to 50m wide.

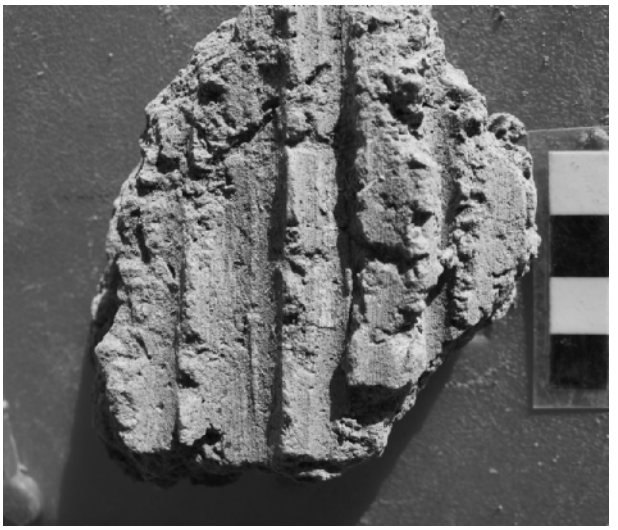

Fig. 5. Underside of mud architectural fragment, probably part of the roof, from collapse layer in *Ubaid Structure 4*. Note the reed impressions.

Fig. 6. View of central room of *Ubaid Structure 4* (facing south) after collapse layer was removed.

Fig. 7. View of the remaining portion of a window or crawl space in northeast corner of *Ubaid Structure 4*'s central room.

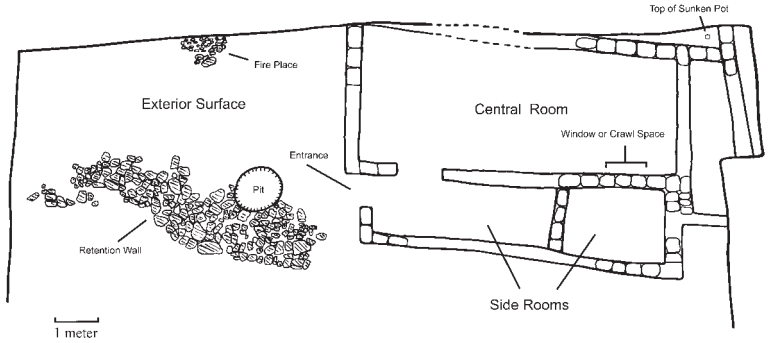

Fig. 8. Plan of *Ubaid Structure 4* showing the large central room and a number of adjacent side rooms.

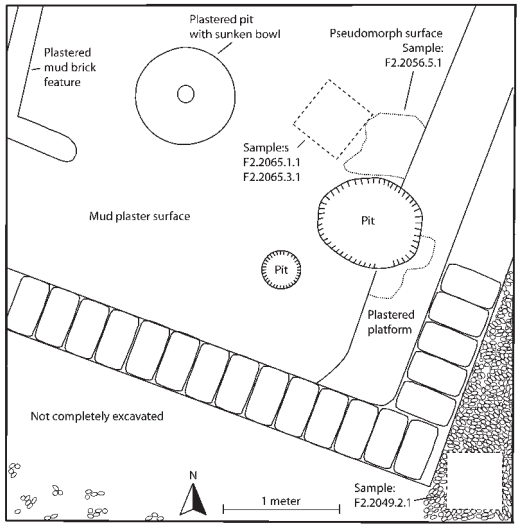

Fig. 9. Plan of Late Chalcolithic period structure in trench F2

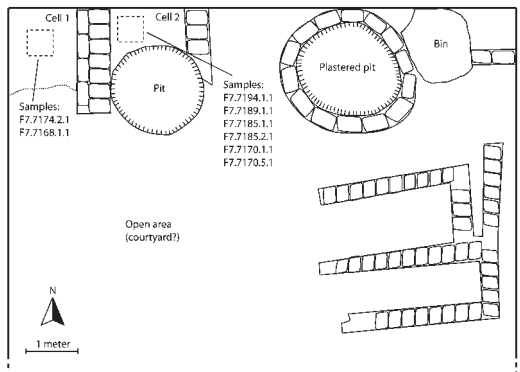

Fig. 10. Plan of Late Chalcolithic period building complex in trench F7

Fig. 11. Individual D.6.145.1 showing basket impression.

Fig. 12. Burial of D.6.155.4 within unfired clay vessel covered with a ceramic bowl.

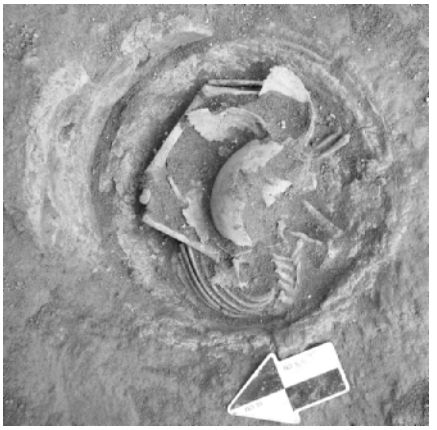

Fig. 13. Individual D.6.155.4 in unfired clay vessel.

Fig. 14. Infant burial D.8.54.1, excavated in 2005, covered with ceramic bowl.

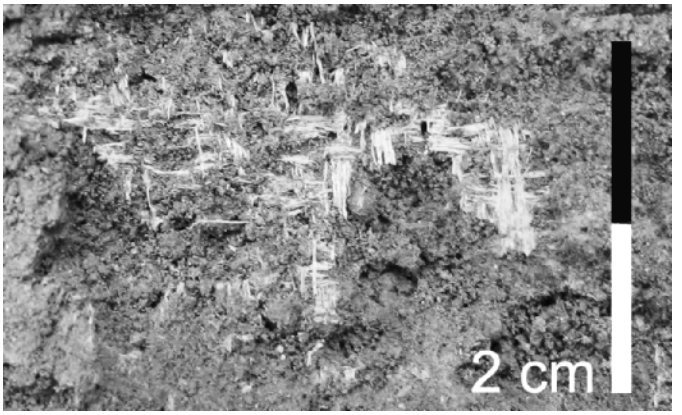

Fig. 15. White fiber material, probably the remains of a textile or reed mat/basket found during the excavation of burial D.8.162.1.

Fig. 16. Chert artifact Descriptions

A. D.8.132.18. Core with regular blade-like removals. Striking platform plain flake scar with ring cracks. Flakes removed from most of circumference. Some step fractures on core face. Edge between platform and flaking face unmodified. Light grey semi-lustrous fling, with cortex on apex. Dimensions 30 x 43 x 40mm; weight 40g.
B. D8.134.20. Core struck from various directions. One of the striking platform has ring cracks. Mid-grey chert with white cortex. Dimensions 35 x 46 x 32mm.
C. D.6.177.7. Arrowhead fragment. Blade of good quality pinkish-grey chert. Invasive retouch on part of ventral surface and semi-invasive edge on left side towards proximal end, and direct on other edge. Dimensions 45 x 20 x 6mm.
D. D.8.91.9. Fragment of a bifacial. Regular serial flaking on both faces meeting at more or less central line. Small patch of cortex on dorsal surface. Lenticular cross-section. Mid orange brown chert.
E. E.2.169.2. Truncated blade of mid-grey chert. Distal end truncated by direct retouch, distal end by inverse retouch. Some flaking on edge of ventral surface. No gloss visible. Dimensions 48 x 17 x 4mm.
F. D.6.160.3. Truncated blade with gloss. Blade of good quality pinkish-grey chert. Distal end truncated by direct retouch. Proximal end snapped. Narrow line of gloss on ventral surface. Dimensions 32 x 14 x 4mm.
G. E.2.186.6. Truncated flake with gloss. Irregular flake from changed orientation core; both ends truncated by direct retouch and slightly concave. Thin line of gloss on dorsal surface and more extensive on ventral. Mid brown-grey chert. Dimensions 38 x 20 x 6mm.
H. E.2.163.2. Large backed and truncated blade-like piece with gloss. Proximal end truncated and right, cortical edge abruptly retouched forming a slightly convex back. Narrow line of gloss on dorsal surface, more extensive on ventral with a curved distribution. Some light nibbling retouch on glossed edge. Dimensions 66 x 23 x 8mm.
I. E.2.166.5. Truncated blade with gloss. Both ends obliquely truncated, distal end minimal but retouch on butt removes bulb and striking platform. Light gloss on right edge, but not well developed. Matt brown chert. Dimensions 48 x 21 x 8mm.
J. E.2.159.9. Small convex backed piece. Pinkish chert (heated?). Abrupt direct retouch on left edge becoming inverse towards the proximal end. Dimensions 42 x 14 x 7mm.
K. E.2.166.5. Small convex backed pied. Abrupt alternate retouch on back. Mid-grey semi-lustrous chert. Dimensions 22 x 12 x 7mm.
L. E.2.193.3. Piercer. End of blade-like piece with retouch on ventral surface off-setting point. Slight rounding on part of right side. Wide plain striking platform. Light creamy coloured chert. Dimensions 56 x 24 x 8mm.
M. E.2.169.2. Piercer. Thickish short stubby point off-set by retouch on flake from multi-directional core. Dimensions 53 x 47 x 17mm.
N. E.2.159.3. Two-pronged piercer. Distal end of flake retouched at both corners and in hollow in between. Dimensions 45 x 40 x16mm.

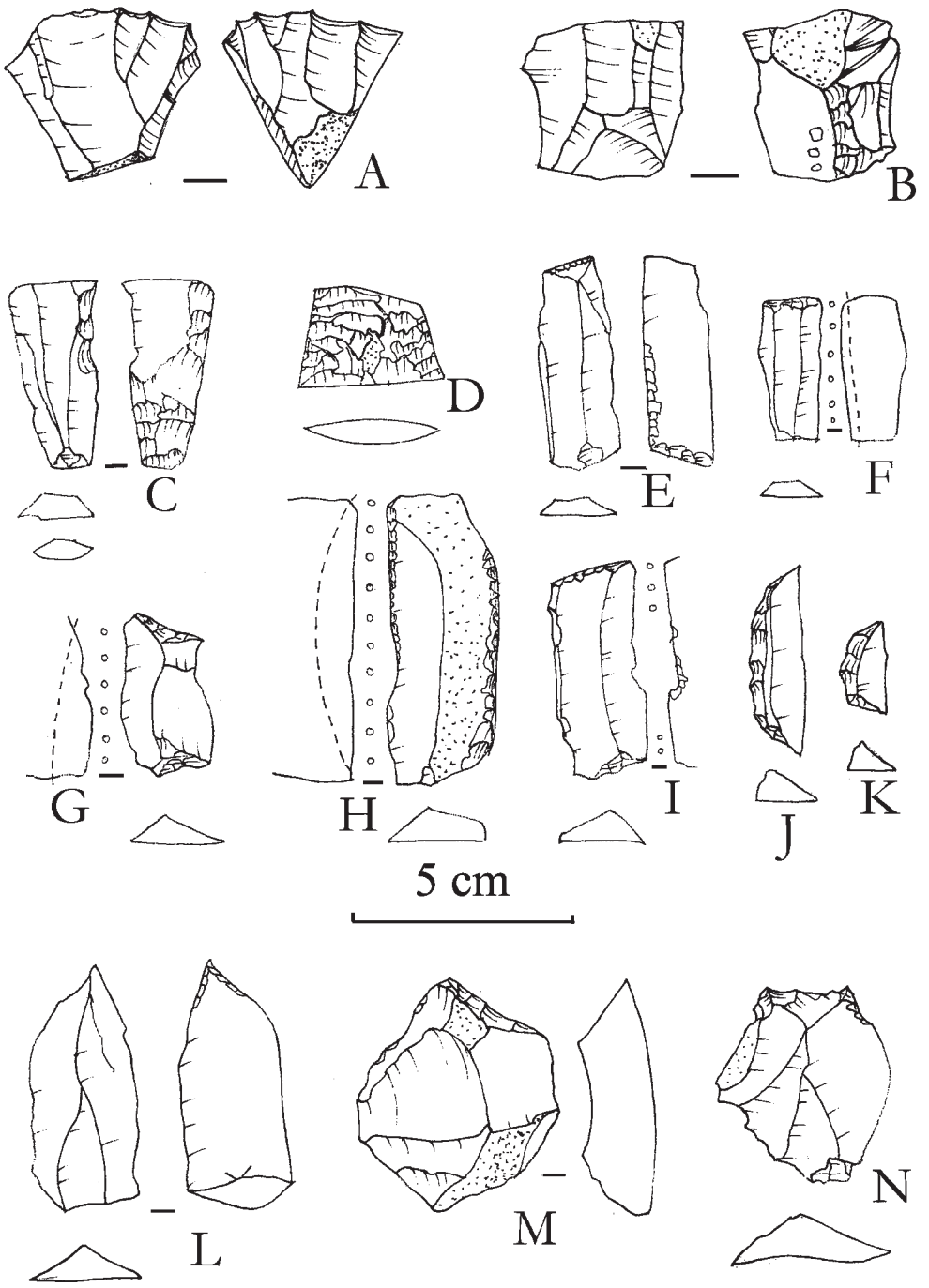

Fig. 16. Chert artifacts from Ubaid contexts at Kenan Tepe.

Fig. 17. Obsidian Artifact Descriptions

A. D.8.147.19. Large flake core with plain striking platform and ring cracks. Some flaking from opposite direction. Not systematically flaked with heavy step fracturing on core face. Dimensions 46 x 49 x 29mm. Weight 72.6g. Green obsidian.

B. D.8.134.3. Small conical core. Single platform core with irregular removals. Striking platform plain and edge between core face and platform unmodified. Dimensions 34 x 36 x 30mm. Weight 20g. Green obsidian.

C. D.8.158.9. Fragment of a blade core. Very damaged but appears to have been bi-directional, but restruck possibly as splintered piece. Dimensions 40 x 19 x 12mm. Green obsidian.

D. E.2.195.2. Splintered piece. Small squat flake with splintering on both ends and on both faces. Dimensions 20 x 24 x 8mm. Green obsidian.

E. D.8.142.3. Splinted piece. Large wide flake with flaking and splintering at both ends and on both faces at proximal end. Dimensions 29 x 37 x 6mm. Obsidian, black with red edge.

F. E.2.159.16. Splintered piece. Blade flaked at both ends on both faces reducing thickness. Dimensions 32 x 13 x 3 (max) mm. Green obsidian.

G. E.2.170.9. Splintered piece. Blade flaked at both ends and on both faces. Flake removed on ventral face at proximal end reduces thickness considerably. Dimensions 21 x 15 x 5mm. Transparent brown obsidian.

H. E.2.159.16. Core for side-blow blade-flake. Blade with side-blow blade flakes removed from both ends. Dimensions 23 x 24 x 7mm. Green obsidian.

I. D.4.4114.12. Core for side-blow blade-flake. Blade with side-blow blade-flake removed from distal part. Dimensions 11 x 15 x 4mm. Green obsidian.

J. D8.161.4. Side-blow blade-flake. Dimensions 9 x 20 x 5mm. Green obsidian.

K. D.8.148.11. Side-blow blade-flake. Dimensions 6 x 30 x 8mm. Green obsidian.

L. E.2.157.8. Blade with edge retouch. Nibbling edge retouch from alternate faces on left edge and direct on right. Marked longitudinal scratch on ventral face. Dimensions 40 x 12 x 6mm. Green obsidian.

M. D.4.4107.2. Blade with edge retouch. Nibbling edge retouch from alternate faces on right edge, meeting at angle and direct on left. Dimensions 36 x 13mm. Green obsidian.

N. D6.165.2. Blade with retouch and rounded edges. Distal end of blade inverse retouch and crushing. Right edge also crushed. Some edge rounding or wear on prominent areas. Dimensions 32 x 13mm. Green obsidian.

O. D.6.141.2. Blade with rounded edges. Proximal fragment of blade with both edges rounded and with some chipping. Grinding on proximal part of ventral face. Dimensions 42 x 16 x 5mm. Green obsidian.

P. D.6.178.11. Çayönü-type tool. Mid segment of blade with lamellar semi-abrupt inverse retouch on both edges. Longitudinal striations. Dimensions 30 x 12 x 4mm. Green obsidian.

Q. D.8.158.3. Çayönü-type tool. Mid segment of blade with abrupt retouch on both edges. Heavy scratching or abrasion on ventral face. Dimensions 22 x 15 x 5mm.

R. D.6.161.3. Blade with inverse nibbling retouch forming ‘tang’ but on distal portion. Some direct retouch towards butt. Dimensions 49 x 10 x 4mm. Green obsidian.

S. D.8.161.9. Blade segment with inverse abrupt retouch forming opposed ‘notches’ Dimensions 27 x 11 x 3mm. Transparent brown obsidian.

T. D.6.158.2. Transverse arrowhead. Small arrowhead made on mid segment of blade with abrupt retouch on sides one of which is slightly abraded. Black obsidian.

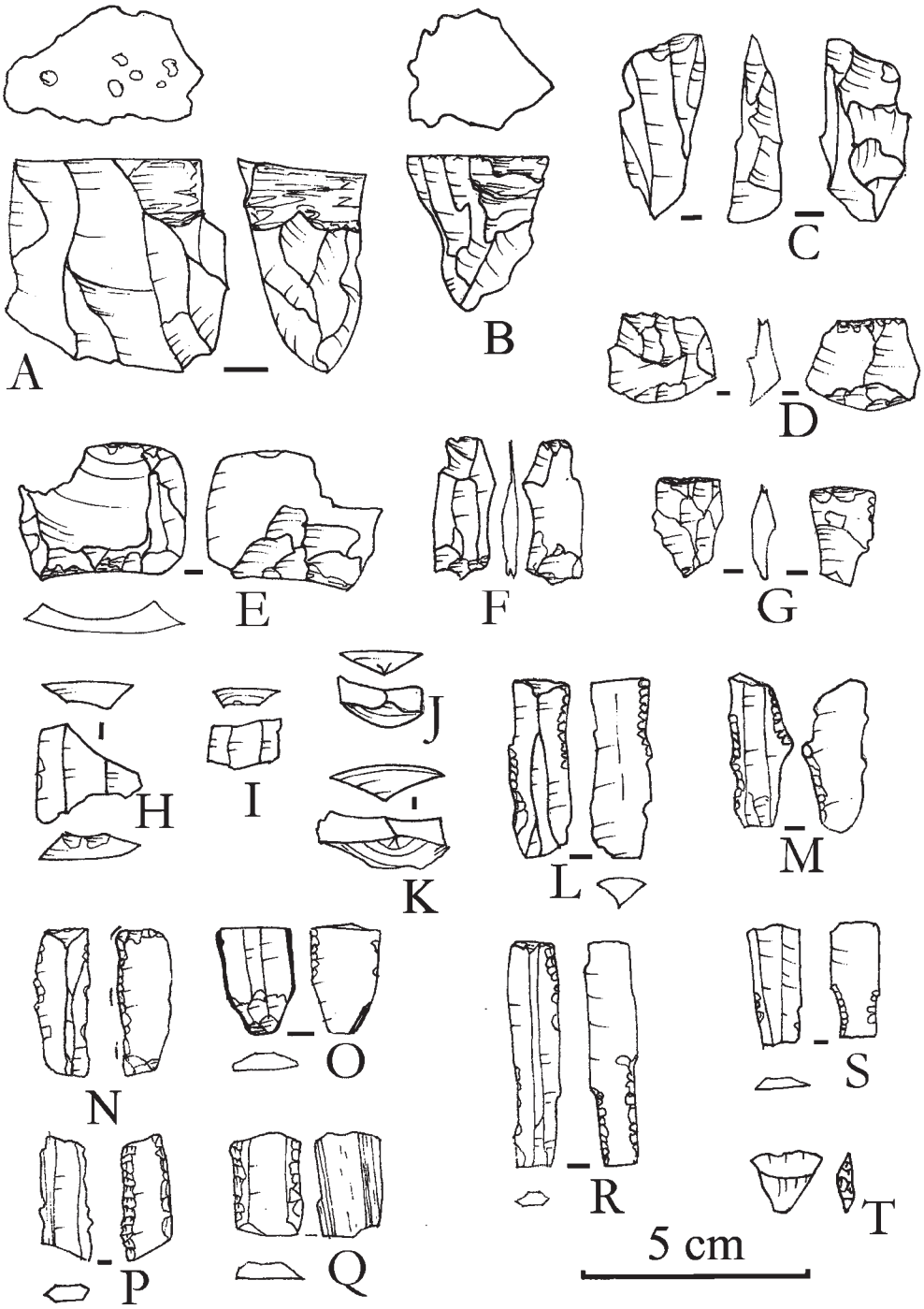

Fig. 17. Obsidian artifacts from Ubaid contexts at Kenan Tepe.

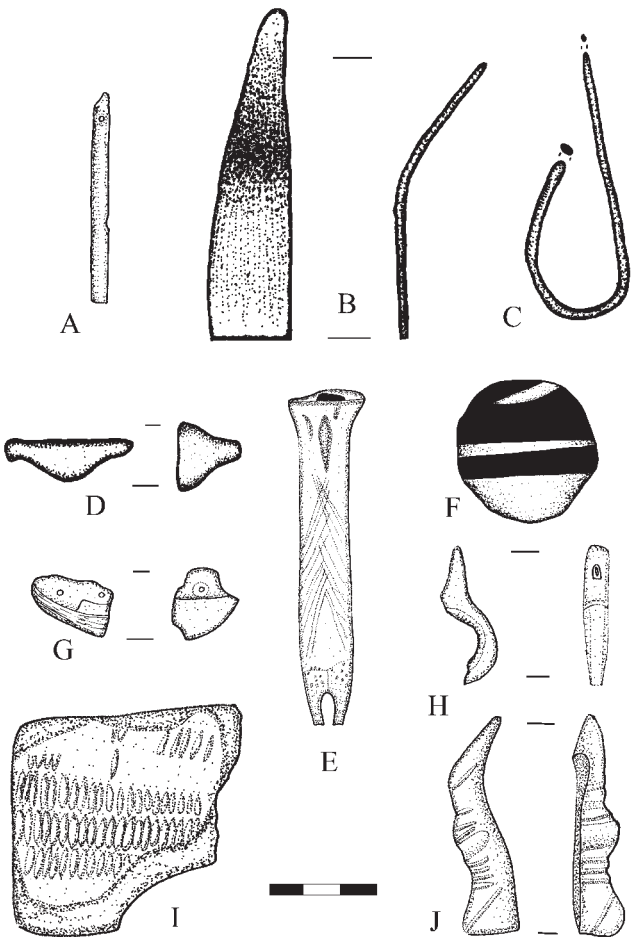

Fig. 18. Small Finds Artifact Descriptions

A. D.4.4134.8. Bone needle with a biconically drilled perforation. Dimensions 5.4 x 0.4 x .35cm. Weight .95g.

B. D.4.4097.5. Wedge-shaped bronze blade bent in deposition. Dimensions 1.8 x 1.3 x 0.2cm. Weight 3.25g.

C. D.6.83.3. Bronze pin damaged in deposition was approximately 12cm in length, but is severely bent into an almost fishhook-like shape. Dimensions (bent) 6.8 x 2.9 x 0.2cm. Weight 3.8g.

D. D.6.178.8. Lozenge-shaped bead broken in antiquity. Exterior was burnished horizontally and slipped in dark brown. The bead was "hard candy" shaped with a circular lozenge center tapering to each end. Dimensions 2.5 x 2.4 x 0.8cm. Weight 3.45g. Exterior slip Munsell: 5YR2.5/2 Dark Reddish Brown.

E. D.6.182.4. Incised bone figurine. Multiple similar artefacts were found burned. The incised decoration was cut into the bone in crossing diagonal marks. Both top and bottom of the artefacts are also ground and shaped. Dimensions 6.7 x 1.4 x 0.8cm. Weight 4.85g.

F. D.6.114.9. Worked sherd disk with exterior paint preserved from original decoration. Dimensions 7.5 x 7.7 x .9cm. Weight 63.2g. Exterior paint Munsell: 5YR2.5/2 Dark Reddish Brown. Exterior Surface Munsell: 5YR6/4 Light Reddish Brown. Interior surface Munsell: 5YR6/4 Light Reddish Brown.

G. D.6.167.6. Shell ornament broken in antiquity. The shell was biconically drilled in two places, with a drilling mark still visible on the obverse (lighter) side of one hole. Dimensions 1.5 x 2.5 x 0.1-.2cm. Weight 2.25g.

H. D.6.167.4. Carved stone pendant in a very light weight white stone with thin swirls of black throughout. Broken in antiquity. Dimensions 4 x 0.7 x 0.6cm. Weight 3g.

I. D.6.174.8. Clay sealing impressed with basketry. The impression records five coils, with the central portion wrapped in thin fiber. Dimensions 6.2 x 5.3 x 2.75cm. Coil height .6cm. Impression dimensions 4.2 x 4cm. Weight 69G.

J. D.8.132.43. Horn-shaped figurine broken in antiquity. Figurine is shaped like a curved bovine horn and is decorated with linear incisions along its length. Dimensions 6.6 x 1.6 x 1cm. Weight 11.45g. Munsell: 2.5/4 YR Dark Reddish Brown.

ANATOLICA XXXV, 2009

A NOTE ON THE PREHISTORY OF THE DEVREK REGION, NORTHERN TURKEY

Güngör Karauğuz[1] *and Bleda S. Düring*[2]

INTRODUCTION

In this brief report we would like to present Prehistoric ceramics collected at a number of sites in central Zonguldak (see fig. 1). These assemblages are of interest in relation to the broader topic of Anatolian Prehistory for two reasons. First, at present nothing has been published about the Prehistory of this part of northern Turkey, except in passing in brief reports in the *Arkeoloji Sonuçları Toplantısı* (Karauğuz 2005; 2006; 2007). Second, we are convinced that some of these sherds date to the fifth millennium BC, and are thus of great importance because they date to the Middle Chalcolithic (ca. 5500 to 4000 cal BC), which is archaeologically poorly documented and understood across most of Asia Minor.

THE SURVEY AND THE REGION

The material presented here was collected in an archaeological surface survey directed by Güngör Karauğuz from Selçuk University in Konya that took place between 2004 and 2006 in central Zonguldak.[3] In this survey the districts (*ilçeler*) of Devrek, Gökçebey, Çaycuma, and Ereğli were investigated. However, the main focus of the survey was on the Devrek district, in which all but one of the sites discussed in this paper are located (fig. 1). Prior to this survey no archaeological work of any kind had been done in the central Zonguldak region. In recent years, however, a rescue excavation was performed in the Ereğli region of Zonguldak, at the site of Yassıkaya, located about 20 kilometres south of the village of Zoroğlu, in which Early Bronze Age remains were uncovered probably dating to the EBA II or III (Efe and Mercan 2001).

The Zonguldak survey was performed by a small team: ranging between six and eight people, and during relatively brief seasons: lasting two to three weeks, and with limited financial resources. In total 46 sites were found in the central Zonguldak survey, many of which are relatively inconspicuous and small. A final report for the survey is in preparation (Karauğuz in prep.), in which the assemblages and sites found in the three

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[3] We would like to thank the Ministry of Culture and Tourism for the survey permit, and the representatives of the ministry: Canan Çaştaban, Mehmet Tüzüner, and Emel Özçelik for their assistance.

seasons will be presented in detail. In this report the focus will be on a number of sites with prehistoric assemblages found in this survey.

The Devrek area of central Zonguldak is a challenging environment for archaeological survey work. Much of the landscape is mountainous and wooded, and many of the archaeological sites are inconspicuous and difficult to detect. One of the main methods for discovering archaeological sites in this area consisted of tapping into local knowledge about the distribution of artefacts. In this manner a number of sites were investigated that would have been difficult to detect by other means: consisting, for example, of a shallow archaeological deposit exposed in a road cut along a minor road in the forest. Further, in some cases archaeological sites could only be reached by hiking on foot for several hours. Again, local knowledge is essential to pinpoint such sites. It is argued here that such methodologies are essential to discover small prehistoric sites (also Düring 2008), and that in the case of the Zonguldak survey various prehistoric sites have been found in this way that shed new light on the prehistory of northern Anatolia.

THE SITES WITH PREHISTORIC ASSEMBLAGES

The prehistoric assemblages we would like to present in this paper derive from the following six sites (fig. 1). These will be briefly presented here, whereas the reader is referred to the final publications of this project (Karauğuz in prep.) for more specific details.

Akbıyık is located 200 metres south of Alparslan village in the Devrek district. The artefacts were found in a sloping agricultural field in the hills surrounded by woods. The extent of the site could not be established, and the sherds are small due to ploughing.

Boncuklar Höyük is located about 7 kilometres from the town of Devrek, near the village of Çolakpehlivan and about 100 metres from the hamlet of Boncuklar. The artefacts were collected from a road cut. The site has been in part removed by the bulldozer, and is in part covered by forest. Little is known about the extent of the site, but the road cut provided a substantial number of diagnostic sherds.

Buldan Höyük is located in the Devrek district, along the road between Devrek and Akçasu, and to the east of the Buldan Çayı. As at Boncuklar the artefacts were collected from a road cut, and the site was either destroyed or covered by forest. Here also, a significant amount of diagnostic sherds were collected as well as a spindle whorl.

İnönü is a cave site in the Ereğli district of Zonguldak, at some distance from the other sites under discussion. It is located about 2 kilometres from the hamlet of Kelçe along the road to Alacabük. The cave is large enough to provide shelter for a number of people and is today covered with a black residue, possibly from recent use and as a result of fires. The sherds found at this location likewise had black residues which are in all probability post-depositional in nature.

Kargılık Mevkii is located in the hills near Bakırcılar village in the Devrek district. Several sherds were found during the excavation of a ditch. The vegetation is dense at this locality and nothing further is known about this site.

Finally, *Türbe Tepe* is also located in the Devrek district, near the villages of Müstakimler and Hatıpoğlu, to the south of the industrial area of Devrek town. Again, little is known about the size of this site.

PREHISTORIC POTTERY FROM CENTRAL ZONGULDAK

On the basis of fabrics and shapes the following groups can be distinguished in the assemblages from the sites listed above. A first group consists of the material from Buldan Höyük and that from Inönü. The material from Boncuklar is distinct from these two assemblages. Finally, the assemblages from Türbe Tepe, Kargılık Mevkii, and Akbıyık appear to have much in common.

At Buldan Höyük two wares can be distinguished. There are a few sherds of a thin fine ware (fig. 9) of about 4 mm in profile. The inclusions in this ware are less than 1 mm in size and few, and the surfaces of these vessels are very smooth. The remaining sherds at Buldan Höyük include more temper, normally about 10% of the fabric, and ranging into larger sizes of up to 5 mm (figs. 6-8). In other respects both wares seem to be similar: cores are often grey, but the surfaces are generally orange to brown. It seems that these vessels were smoothed by wiping with a soft wet implement before they had finished drying, creating a thin slip visible in the sections. There are some vessels with signs of wiping and there no edges to the slip.

In terms of shapes the most conspicuous elements are handles with knobs on the 'elbows' (fig. 6: 1-4, and 6). These handles have parallels at a number of sites in northern Asia Minor: such as Büyük Güllücek (Kosay and Akok 1957: plates xviii and xix); Orman Fıdanlığı 7 (Efe 2001: 108, fig. 20: 3.13-17); and at Ikiztepe (Alkım *et al.* 2003, plate xi). It will be argued later in this paper that these handles can be dated to the Middle Chalcolithic, or more specifically the 5th millennium BC. Other elements of the ceramics of Buldan Höyük suggest a later date, however. For example, the round handle applied to the rim of a fine ware vessel (fig. 9: 23) appears similar to vessels from Early Bronze Age Demircihüyük (Seeher 1987: plate 32: 24). We have not been able to find convincing parallels for the tapering and everted rims found at Buldan Höyük (fig. 8: 9-12), with one exception (compare fig. 8: 12 with Alkım *et al.* 1988: plate vii: 10), but it is not unlikely that these also date to the Early Bronze Age.

The assemblage from Inönü seems largely comparable to that from Buldan Höyük. The paste of sherds at this site are yellowish grey to dark grey, and most sherds have about 5% of temper, predominantly mica and calcium less than 1 mm in size. Amongst the diagnostic sherds there is one handle with knob on the elbow (fig. 10: 1) similar to those from Buldan Höyük. One body sherd with a raised ledge with oval impressions (fig. 10: 2) seems to have good comparanda in Early Bronze Age Demircihüyük and Ikiztepe (Seeher 1987: plate 46: 23-24; Alkım *et al*. 1988: plate xix: 3, plate xx: 8-9, plate li: 2). Finally, a fragment of fine ware with a handle stub on the carination (fig. 10: 7), has marks on the interior that suggest it was produced on a fast turntable, which would date this piece to the later part of the Early Bronze Age or after. Thus, as at Buldan Höyük, we

appear to be dealing with a mixture of 5th millennium material and artefacts dating to the Early Bronze Age.

At Boncuklar Höyük the surface colour of the sherds ranges from orange to brown, and cores are usually grey. Temper is mineral, mostly calcium, and up to 2 mm in size. Several sherds show evidence of wiping with some sort of plant material in medium hard condition, and almost all have a thin slip. One sherd (fig. 3: 32) shows evidence for scraping with a sharp implement, possibly a chipped stone implement, resulting in several parallel grooves on the interior.

One of the Boncuklar sherds has a horizontal ledge mimicking a rope (fig. 3: 1), which has good parallels at Büyük Güllücek and Ikiztepe (Koşay and Akok 1957: plate xviii; Alkım *et al*. 2003: plate lxx). Likewise a sherd with a row of impressions just below the rim (fig. 4: 11) also has parallels at these sites (Koşay and Akok 1957: plate xix; Alkım *et al*. 1998: plate xxvii: 14; 2003: plate lxx: 1). Finally, a group of flat bases were found at Boncuklar Höyük (fig. 5: 12, 13, 15, 16), one of which (12) has been horizontally burnished on the exterior. A base sherd of similar type was also found at Buldan Höyük (fig. 8: 13). These bases show some similarities with bases found at Büyükkaya (Schoop 2005: plate 23: 4-8), which have been tentatively dated to the Early Chalcolithic (Schoop 2005: 335-343), but comparanda can also be found in Late Chalcolithic Demiricihüyük G Ware (Seeher 1987: plate 27: 13).

At Türbe Tepe (fig. 12), we are probably dealing with an Early Bronze Age I material. Sherds normally have a red surface and a grey core. Some have considerable amount of mineral temper, including quartz and up to 3 mm large, others have less and finer grained temper. One sherd has a large vertical handle that was fixed in a hole in the vessel (fig. 12: 3), a technique well known from the Early Bronze Age, and two others have upturned crescentic handles (fig. 12:1-2) well known from Early Bronze Age Demircihüyük (Seeher 1987: plate 50: 26-27), while a raised ledge with impressions (fig. 12: 4) also has parallels at EBA Demircihüyük (Seeher 1987: plate 46: 23-24).

Finally, the material from Akbıyık and Kargılık Mevkii seems comparable to that of Türbe Tepe in terms of fabric. At both sites large handles and well developed rim distinctive rim types occur, which suggest that these also probably date to the Early Bronze Age. There are no indications that any of these sherds derive from wheel thrown pots. One of the handles has a perforation (fig. 2: 9), another seems to end in a loop, and could be comparable to vessels found at nearby Yassıkaya (Efe and Mercan 2001).

DISCUSSION AND CONCLUSION

Dating prehistoric surface assemblages in northern Asia Minor is a problematic exercise for two reasons. First, it is difficult to assess the chronological homogeneity of survey assemblages. At various of the sites discussed here, several periods seem to be represented, and diagnostic sherds that have good comparanda are often singular, whereas one would like to have several links between sites being compared to suggest a convincing date.

Second, the chronology of prehistoric northern Asia Minor remains problematic, due to an absence of excavated sequences for most of the period. Even for the Early Bronze Age, a period which has been extensively investigated across Anatolia, chronology can still be a challenge, as exemplified in the discussion of the Yassıkaya material by Efe and Mercan (2001). The earlier periods in this region are even more difficult. We know next to nothing about the period between 10.000 and 6000 BC (Düring 2008), and the chronology of the subsequent Chalcolithic is fraught with difficulties, and frequently revised (Parzinger 1993; Thissen 1993; Özdoğan 1996; Efe 2001; Schoop 2005).

As a consequence of these two problems, dating assemblages often has to proceed by comparing individual sherds from survey assemblages with evidence from elsewhere. In most cases the dates arrived at in this manner are highly tentative. In this paper, we have argued that there are Early Bronze Age period ceramics at the sites of Buldan Höyük, Inönü, Türbe Tepe, Akbıyık, and Kargılık Mevkii. Most of these ceramics probably date to the EBA I, given the absence of elements such as pointed beaks, but this cannot be proven.

Less secure is the date of the assemblage from Boncuklar Höyük. At this site all comparanda point to the Chalcolithic, but given that this is a period lasting three millennia, that does not really bring us much further. The flat bases of Boncuklar have parallels at both 'Early Chalcolithic' Büyükkaya and Late Chalcolithic Demircihüyük. Better are parallels with Büyük Güllücek, a site which can be dated with some confidence to the early fifth millennium BC on the basis of similarities between this site and the better dated site of Güvercinkayası to the south (Gülçür 2004). The comparanda of Ikiztepe are much less usefull for chronological purposes, given that the chronology of the site as published is problematic (Thissen 1993; Schoop 2005: 315-322). Very tentatively, a date for Boncuklar in the early fifth millennium BC is put forward here.

Most useful for dating purposes are the handles with knobs on the shoulder, often designated 'horned handles', which have been found at Buldan Höyük and Inönü. These handles are known from other sites such as Büyük Güllücek (Koşay and Akok 1957), Orman Fıdanlığı 6 and 7 (Efe 2001), what has been labelled Ikiztepe BB (Schoop 2005), and at Alaca Höyük (Thissen 1993). Whereas Büyük Güllücek probably dates to the early fifth millennium, most of the other sites mentioned probably date to the second half of the fifth millennium BC (Thissen 1993; Schoop 2005). Further, it has been argued that in this particular period there were strong cultural links between northern Asia Minor and the northeast Aegean, where similar 'horned handles' have been found (Thissen 1993; Schoop 2005: 326-7). At sites such as Kumtepe A, Emporio, Tigani, Gülpınar, Beşik-Sivritepe, and Alacalıgöl, numerous parallels with the sites discussed here can be noted, although comparisons over such great distances should be treated with some caution, especially because there is no close correspondence between Orman Fıdanlığı and these coastal sites. However, if links between the northeast Aegean and northern Asia Minor are accepted, the former region provides an excellent chronological anchor, given that the Troadic sites have been radiocarbon dated to between about 5000 and 4500 cal BC (Gabriel 2000; Gabriel *et al.* 2004).

In summary, we have presented a number of prehistoric assemblages deriving from six ephemeral sites in central Zonguldak, which have been located by tapping into local knowledge. In this way a number of Chalcolithic assemblages were found, of which the Boncuklar Höyük can be tentatively dated to the early fifth millennium BC, whereas in the Buldan Höyük and Inönü assemblages there is a Chalcolithic component that can be dated somewhat later in the fifth millennium with some degree of confidence. We hope that this paper has shed some light on this little known time period in northern Asia Minor, which is in need of further investigation.

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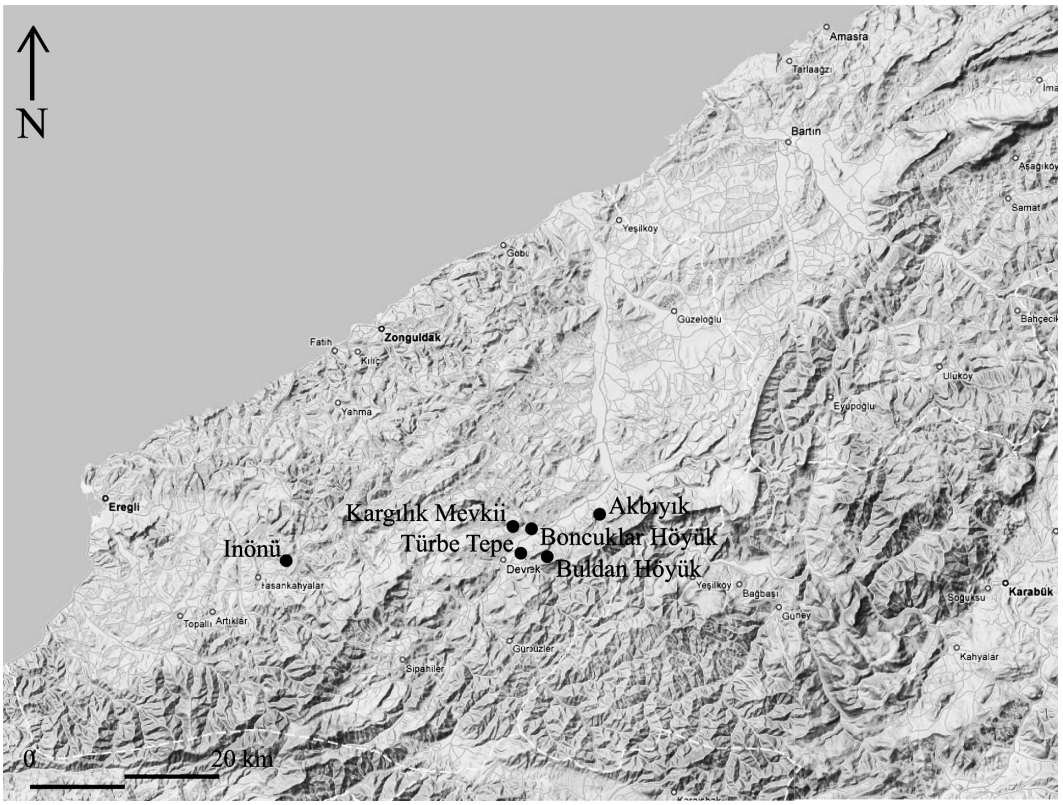

Figure 1

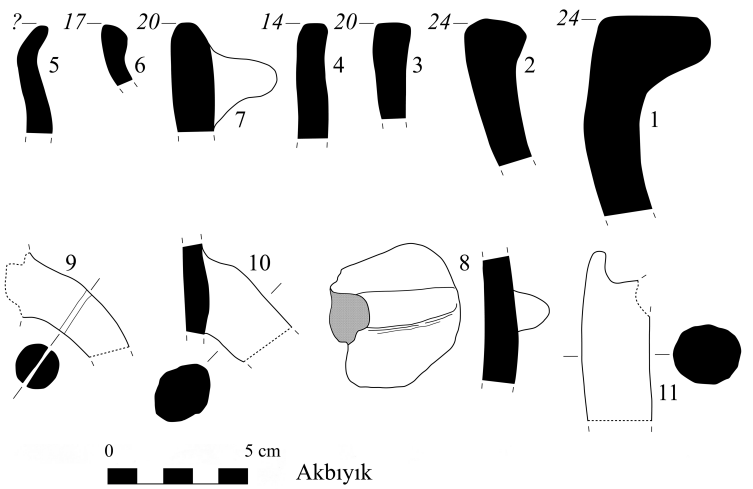

Figure 2

Pottery Catalogue – Figure 2

Akbıyık/1. Temper about 5% of fabric, probably calcium, and mostly quartz, up to 4 mm in size. Red to brown surface, with quartz grits on surface, grey core.

Akbıyık/2. Temper about 5% of fabric, probably calcium, and mostly quartz, up to 2 mm in size. Red to brown surface, with quartz grits on surface, core red to brown.

Akbıyık/3. Temper about 5% of fabric, probably mica and calcium, up to 1 mm in size. Red to brown surface, with quartz grits on surface, grey core.

Akbıyık/4. Temper about 10% of fabric. Calcium, up to 2 mm in size. Red to brown surface, with calcium grits on surface, core red to brown.

Akbıyık/5. Hardly any temper (some minute calcium). Red to brown surface exterior, dark grey on interior, core grey to brown.

Akbıyık/6. Temper about 5% of fabric, probably mica and mostly quartz, up to 0.5 mm in size. Dark grey, gritty surface, core is grey.

Akbıyık/7. Temper about 30% of fabric, probably calcium, and mostly quartz, up to 3 mm in size. Reddish surface, with quartz grits on surface, core is red.

Akbıyık/8. Temper about 20% of fabric, probably calcium, and mostly quartz, up to 4 mm in size. Reddish to brown surface, with quartz grits on surface, grey core.

Akbıyık/9. Temper about 5% of fabric, probably calcium, and mostly quartz, up to 1 mm in size. Red to brown surface, with quartz grits on surface, core same.

Akbıyık/10. Temper about 5% of fabric, probably calcium, and mostly quartz, up to 0.5 mm in size. Red to brown surface, with quartz grits on surface, grey core.

Akbıyık/11. Temper about 20% of fabric, mineral, mostly calcium, up to 1 mm in size. Red to brown surface, with calcium grits on surface, grey core.

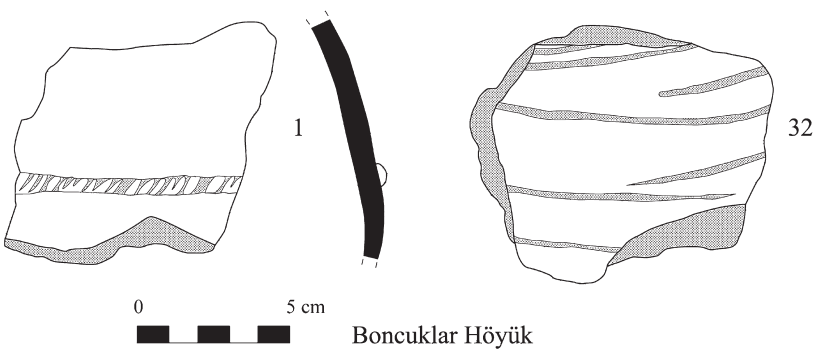

Figure 3

Pottery Catalogue – Figure 3

Boncuklar Höyük/1. Temper about 10% of fabric. Mineral: calcium, mica, gritt. Up to 3 mm mm in size. Surface grey, smoothed but rough, core also grey.

Boncuklar Höyük/32. Little temper visible, mostly minute calcium. Exterior is brown, smoothed. Interior is brown and has been scraped, resulting in parallel grooves. Grey at core, except for surfaces.

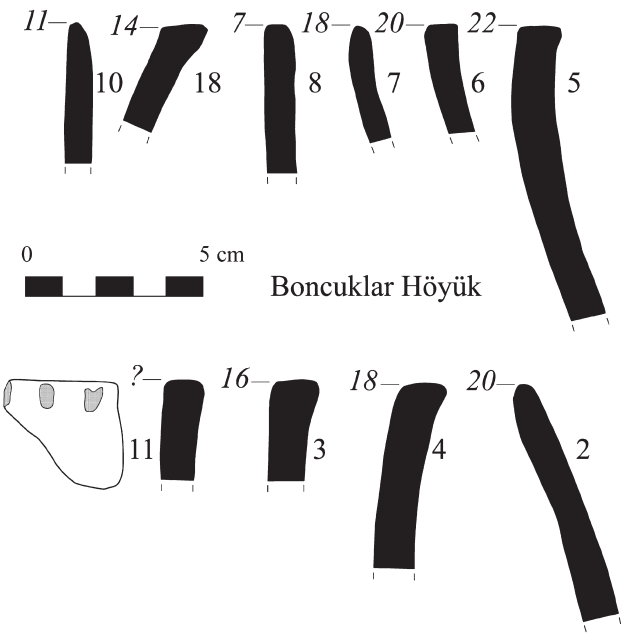

Figure 4

Pottery Catalogue – Figure 4

Boncuklar Höyük/2. Temper about 5% of fabric. Mineral, mostly calcium, up to 0.5 mm in size. Interior brown, wiped. Exterior has grey coating with vegetal inclusions. Core grey except surfaces.

Boncuklar Höyük/3. Some temper, minute calcium and mica. Reddish brown surface, possibly slipped. Yellow to grey at core, surfaces red.

Boncuklat Höyük/4. Temper about 10% of fabric, mineral, mostly calcium and gritt, up to 1 mm in size. Interior light brown, smooth, exterior is brown and shows vegetal impression, possibly from wiping.

Boncuklar Höyük/5. Temper about 5% of fabric, mineral, calcium, mica, up to 0.5 mm in size. Orange exterior, brown interior. Rough surface. Grey at core ranging to brown and orange.

Boncuklar Höyük/6. Temper about 5% of fabric. Minute calcium, 0.5 mm in size. Surface red, possibly slipped. Grey at core, surfaces red.

Boncuklar Höyük/7. Hardly any temper, some minute calcium. Surface light brown. smoothed or slipped. Core grey throughout except surfaces.

Boncuklar Höyük/8. No temper visible. Surface brown, smoothed, undulating surface. Some black smudging on collar. Core grey throughout except surfaces.

Boncuklar Höyük/10. Temper about 10% of fabric. Possibly vegetal, also small gritt up to 2 mm. Surface grey, smoothed. Core grey throughout.

Boncuklar Höyük/11. Temper about 5% of fabric, mineral, calcium, mica, gritt, up to 0.5 mm in size. Surface light brown, smoothed or slip. Core grey throughout except surfaces.

Boncuklar Höyük/18. Little temper, some minute calcium. Reddish brown surfaces, wet treated? Grey at core, except for surfaces.

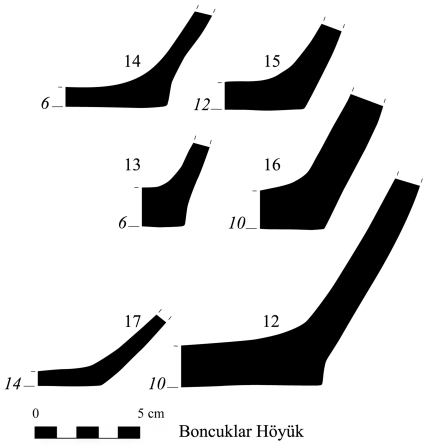

Figure 5

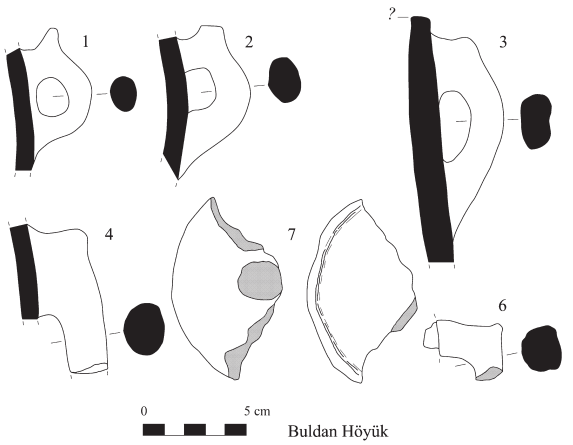

Figure 6

Pottery Catalogue – Figure 5

Boncuklar Höyük/12. Temper about 10% of fabric, mineral, calcium, gritt, up to 0.5 mm in size. Surface brown, exterior burnished horizontally. Core ranges from red to grey.

Boncuklar Höyük/13. Temper about 10% of fabric, mineral, calcium, mica, up to 1 mm in size. Exterior is black, also below base. Grey at core, and on interior surface.

Boncuklar Höyük/14. Temper about 10% of fabric, mineral, calcium, mica, up to 1 mm in size. Exterior is black, below base. Grey at core, and on interior surface.

Boncuklar Höyük/15. Temper about 5% of fabric, mineral, calcium, gritt, up to 1 mm in size. Surface orange, possibly slipped. Core grey throughout except outer surface.

Boncuklar Höyük/16. Temper about 5% of fabric, mineral, calcium, gritt, up to 1 mm in size. Exterior is red, slipped? Grey at core, except both surfaces.

Boncuklar Höyük/17. Temper about 5% of fabric, mineral, calcium, mica, up to 1 mm in size. Exterior is brown and smooth. Core grey-brown throughout.

Pottery Catalogue – Figure 6

Buldan Höyük/1. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange, smooth, probably slipped. Grey core, orange surfaces.

Buldan Höyük/2. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange-brown colour. Smooth, possibly slipped. Grey core, orange brown surfaces.

Buldan Höyük/3. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange-brown colour. Smoothed with wet object? Interior rough. Grey core, orange surface on the interior.

Buldan Höyük/4. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably slipped / wet smoothed. Grey core, orange surfaces.

Buldan Höyük/6. Temper about 5% of fabric. Mineral, angled. Probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange to grey colour. Wet Smoothed. Grey core, orange surfaces.

Buldan Höyük/7. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Top surface wet smoothed. Bottom rough. Core orange-grey throughout.

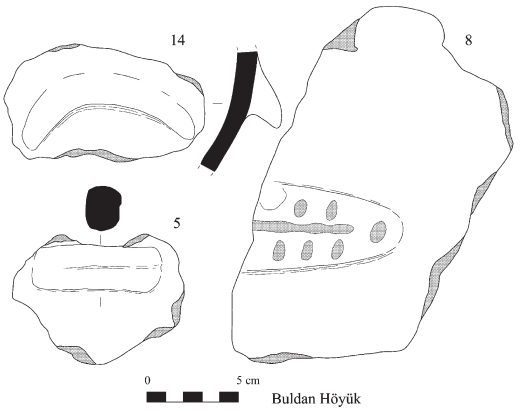

Figure 7

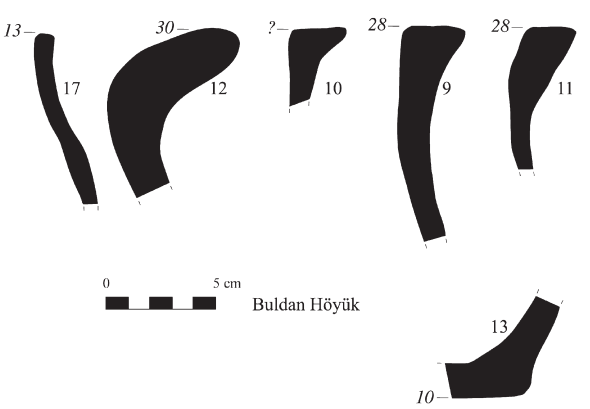

Figure 8

Pottery Catalogue – Figure 7

Buldan Höyük/5. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably slipped / wet treated. Interior rough. Grey core, surface orange.

Buldan Höyük/8. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably wet treated on outer surface. Grey core, orange surfaces.

Buldan Höyük/14. Temper about 10% of fabric. Mineral, angled. Predominantly calcium, up to 4 mm in size. Surface orange. Smooth, probably wet smoothed. Grey core, orange surfaces

Pottery Catalogue – Figure 8

Buldan Höyük/9. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably wet smoothed or slipped. Wipe lines clearly visible. Grey core, orange surface.

Buldan Höyük/10. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably wet treated / slipped. Grey core, orange surfaces.

Buldan Höyük/11. Temper about 10% of fabric, mineral, probably mica and predominantly calcium, which occurs in chunks up to 5 mm. Surface reddish brown. Smooth, probably slipped / wet smoothed. Core reddish brown throughout.

Buldan Höyük/12. Temper about 5% of fabric, mineral, probably calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably wet treated. Grey core, orange surfaces.

Buldan Höyük/13. Temper about 10% of fabric, mineral, probably quartz and some calcium, mostly less than 3 mm in size. Surface orange. Smooth, probably slipped. Grey core, orange surfaces.

Buldan Höyük/17. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably slipped. Grey core, orange surfaces.

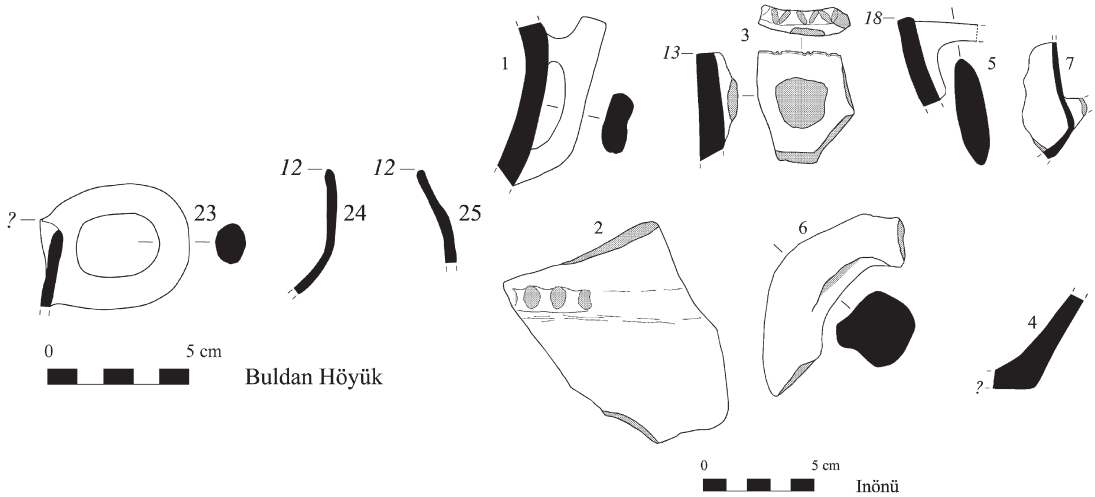

Figure 9

Figure 10

Pottery Catalogue – Figure 9

Buldan Höyük/23. No temper. Surface orange. Smooth, probably slipped. Grey core, orange surfaces.

Buldan Höyük/24. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface red. Smooth, probably slipped. Grey core, red surfaces.

Buldan Höyük/25. Temper about 5% of fabric. mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface orange. Smooth, probably slipped. Grey core, ranging to orange.

Pottery Catalogue – Figure 10

Inönü/1. Temper about 5% of fabric, mineral, probably mica and calcium, mostly less than 1 mm in size. Light grey to dark grey surface. Rough surface on interior and exterior. No slip or burnishing. Core grey throughout. Black residue on exterior surface.

Inönü/2. Temper about 5% of fabric, mineral, probably mica and calcium, mostly less than 1 mm in size. Light yellowish grey to dark grey surface. Rough surface on interior and exterior. Exterior shows evidence for horizontal scraping. Core grey throughout. Black residue on exterior and interior (not soot).

Inönü/3. Temper about 5% of fabric, mineral, probably mica and chalcium, mostly less than 1 mm in size. Light yellowish grey to dark grey surface. Rough surface on exterior. Interior surface is reddish, could be a self slip. Grey at core and edge. Interior surface red. Some black residue on exterior below rim (not soot).

Inönü/4. Temper about 20% of fabric, mineral, probably mica and predominantly chalcium, mostly less than 1 mm in size. Dark grey surface and interior. Smoothed surface on exterior and interior. Black smudging on both sides. Grey at core and edge.

Inönü/5. Temper about 20% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Dark grey surface and interior. Smoothed surface on exterior and interior, some scraping around handle attachment. Black smudging along rim. Grey at core and edge.

Inönü/6. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Surface yellowish grey to dark grey surface and interior. Rough surface, some scraping marks. Grey at core and edge.

Inönü/7. Temper about 5% of fabric, mineral, probably mica and predominantly calcium, mostly less than 1 mm in size. Yellowish grey to dark grey surface and interior. Smooth surface. Interior dark grey, but shading into yellowish red on exterior. In interior there are cylindrical marks suggestive of fast turntable.

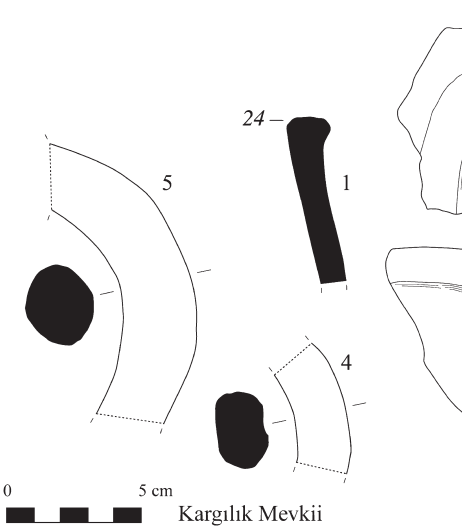

Figure 11

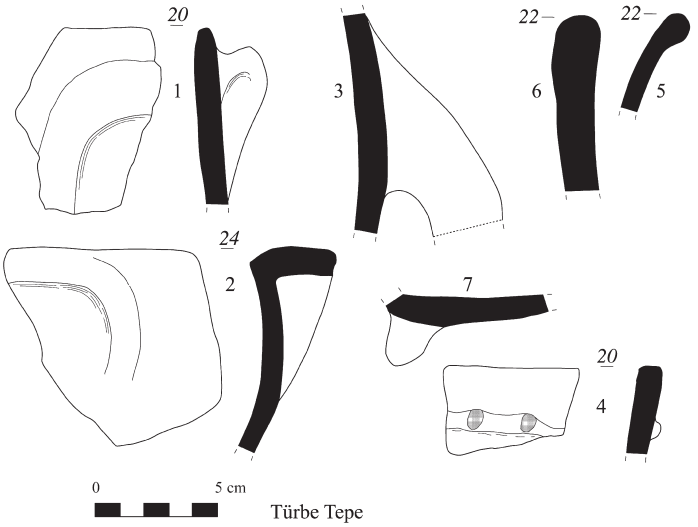

Figure 12

Pottery Catalogue – Figure 11

Kargılık Mevkii/1. Temper about 10% of fabric, mineral, probably calcium, and quartz, mostly less than 1 mm in size. Brown surface, scraped smooth.

Kargılık Mevkii/4. Temper about 5% of fabric, mineral, probably calcium, and quartz, mostly less than 0.5 mm in size. Yellowish brown surface, smooth. Core yellowish brown throughout.

Kargılık Mevkii/5. Temper about 5% of fabric, mineral, probably calcium, and quartz, mostly less than 1 mm in size. Red to brown surface, smooth, surface, wet strokes. Yellow at core, red to brown at surface.

Pottery Catalogue – Figure 12

Türbe Tepe/1. Temper about 20% of fabric, mineral, probably calcium, and mostly quartz, up to 3 mm in size. Reddish surface, smoothed but rough edges. Grey core, red to brown at surface.

Türbe Tepe/2. Temper about 20% of fabric, mineral, probably calcium, and mostly quartz, up to 3 mm in size. Reddish surface, smoothed but rough edges. Yellow core, red to brown at surface.

Türbe Tepe/3. Temper about 10% of fabric, mineral, probably calcium, and quartz, up to 4 mm in size. Red surface, smoothed. Grey core, red to brown at surface. Handle applied and fixed within perforated hole.

Türbe Tepe/4. Temper about 5% of fabric, mineral, mostly calcium, up to 1 mm in size. Light brown, smooth surface (slip). Grey core, light brown at surface.

Türbe Tepe/5. Temper about 5% of fabric, some mica, up to 0.5 mm. Red surface, smoothed edges, interior brown smudge. Grey core, red to brown at surface.

Türbe Tepe/6. Temper about 5% of fabric, some calcium, up to 0.5 mm. Red brown surface, smooth. Grey core. Black smudging on interior and exterior – or is it a slip?

Türbe Tepe/7. Temper about 5% of fabric, some minute calcium. Red surface, exterior smoothed. Grey core, red to brown at surface.

ANATOLICA XXXV, 2009

NEOLITHIC "CULT TABLES" FROM BARCIN HÖYÜK

Heiner Schwarzberg[*]

The campaigns of 2005 and 2006 at the twin mound of Barcın Höyük (formerly Yenişehir II) in the Yenişehir Plain revealed several fragments of so called "cult tables", small rectangular boxes on legs, made of clay[1]. The collection consists of 21 pieces[2]: four single legs and 17 bigger and smaller wall fragments:

1. *Fig. 1,1:* Grey to dark brown corner fragment, well burnished – H approx. 8,9 cm, complete height preserved – short angular leg directly rising from the wall – surface A[3] without ornament but with traces of a broken off handle – surface B with framed fine incised ornament consisting of net filled triangles – unstratified.

2. *Fig. 1,2:* Light grey brown corner fragment, burnished (surface partly eroded) – H approx. 4,5 cm – surfaces A and B with fine incised lines, A with net-like ornament – surface B unornamented with traces of a roundish handle – stratified.

3. *Fig. 1,3:* Brownish corner fragment, nearly square shape, burnished – H approx. 5,6 cm, complete height preserved – short roundish leg directly rising from the wall – surface A with framed fine incised vertical ornament consisting of empty and dot-filled zigzag lines – surface B unornamented with traces of a roundish, slightly bent handle – unstratified.

4. *Fig. 2,2:* Long triangular leg with rounded edges and traces of the wall – H approx. 6 cm – surface A with unframed fine incised ornament consisting of net-filled triangles – surface B without ornament – stratified.

5. *Fig. 2,3:* Black deep corner fragment, well burnished – H approx. 6,2 cm – thin and straight wall – broken off triangular leg directly rising from the wall – surfaces A and B without ornament – unstratified.

6. *Fig. 3,1:* Black deep corner fragment, burnished – H approx. 9 cm, complete height preserved – thin and straight wall – short oval leg directly rising from the wall – surfaces A and B without ornament – stratified.

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I would like to thank Jacob Roodenberg (Leiden) for his kind offering of the possibility to study the Neolithic table fragments from Barcın Höyük. The drawings have been made by Juliane Filipp (Halle/Saale) on the base of sketches and rectified digital photographs; figs. 2,1 and 6B have been drawn by Ben Claasz Coockson (Bilkent University, Ankara).

[1] Schwarzberg 2005; Schwarzberg 2005a. The name "cult table" was introduced to SE European Prehistory in the first half of the 20th century. It is used here as a *terminus technicus* not as an interpretation – for the discussion of possible functions of this distinctive type of vessel: see Schwarzberg 2003.

[2] The ten stratified items from Barcın Höyük have been already mentioned in Roodenberg et al. 2008, 55 fig. 6.

[3] Schwarzberg 2005, 249. The ornamental surfaces are defined by their position left (surface A) or right (surface B) of the corner.

7. *Fig. 3,2:* Dark grey brown, short conical leg fragment, burnished (surface partly eroded) – H approx. 4 cm – short oval leg directly rising from the wall – without ornament – unstratified.

8. *Fig. 3,3:* Light grey brown corner fragment, burnished – H approx. 7,2 cm – straight wall with a complete conical handle – short oval leg slightly retracted under the wall – surfaces A and B without ornament – unstratified.

9. *Fig. 4,1:* Light brown rim fragment, well burnished – H approx. 4,4 cm – straight wall – surface with a thin but coarse three-rowed frame line and a complex group of incised symbols below (see also no. 14) – unstratified.

10. *Fig. 4,2:* Light brown rim fragment, well burnished – L approx. 6 cm – straight wall – surface with a thin but coarse three-rowed frame line – stratified.

11. *Fig. 4,3:* Deep, reddish brown rim fragment, well burnished – H approx. 4,8 cm – straight wall – surface with an unframed ornament consisting of empty and dot-filled zigzag lines and/or rows of triangles – stratified.

12. *Fig. 4,4:* Grey brown to light brown rim fragment, well burnished – L approx. 3,3 cm – straight wall – surface with a thin but coarse three-rowed ornament or frame line – unstratified.

13. *Fig. 4,5:* Dark brown rim fragment, well burnished – H approx. 2,8 cm – straight wall – surface with a thin but coarse three-rowed frame line and probably a complex group of incised symbols below (see also no. 10) – unstratified.

14. *Fig. 4,6:* Light brown, nearly rectangular corner fragment, burnished – H approx. 3,2 cm – straight wall – surface A without ornament – surface B with thin but well made incised lines forming an unframed x-shaped motif – unstratified.

15. *Fig. 4,7:* Dark grey brown, nearly rectangular deep corner fragment, burnished – H approx. 3,6 cm – straight wall – surface A without ornament – surface B with two well-made diagonal incisions which probably have been encrusted – unstratified.

16. *Fig. 4,8:* Grey brown long conical leg with traces of the wall – H approx. 3,8 cm – surface A without ornament – surface B with framed ornament consisting lines and dots – unstratified.

17. *Fig. 4,9:* Corner fragment, burnished – H approx. 3 cm – surface A without ornament but with traces of a broken-off handle – surface B with thin but well-made incised lines forming a unframed x-shaped motif – stratified.

18. *Fig. 4,10:* Uncertain deep corner fragment, burnished – H approx. 3,2 cm – surface A probably without ornament – surface B with thin incised zigzag lines – stratified.

19. *Fig. 4,11:* Grey brown slightly conical leg with traces of the wall – H approx. 3,4 cm – surface A without ornament – surface B with framed ornament consisting of lines and dots – stratified.

20. *Fig. 4,12:* Uncertain deep rim fragment, burnished – L approx. 5 cm – slanting wall – surface with thin but well-made incised lines forming a complex triangular motif – stratified.

21. *Fig. 4,13:* Rim fragment, burnished – L approx. 3,2 cm – straight wall – surface with thin but well-made incised lines forming an unframed x-shaped motif – stratified.

Ten fragments from Barcın Höyük (cat.-nos. 2, 4, 6, 10, 11, 17-21) are stratified and come from the Neolithic level. The other pieces have been discovered from younger (mixed) occupation contexts but their shape and decoration clearly prove that they are chronologically and typologically tied to the stratified tables.

Cult tables from Anatolia and Turkish Thrace are known from more than two dozens of sites from approximately 6400 cal. BC to 5000 cal. BC (fig. 5). They can be divided into three typological and ornamental groups: first, a deep and box-like type with fine incised ornaments which is mainly related to the Northwest of Anatolia but which is also known in the Burdur region and the Aksaray-Niğde region (Schwarzberg 2005a, 256-261 fig. 2-3). Second, a generally unornamented shallow type with long or short legs known from the Lake District and the Konya Plain (Schwarzberg 2005a, 261 fig. 4). Finally, in Thrace, a type of prismatic vessel on three or four legs which is well known from contexts of the 6th millennium from the Balkans (Schwarzberg 2005a, 261 fig. 7.4-11) and indirectly related to the West Anatolian types of the second half of the 7th millennium. With all necessary care they can be added to the concept of the so-called "Neolithic Package" (Schwarzberg 2006; Çilingiroğlu 2005).

Barcın Höyük is part of a concentration of Neolithic sites in the eastern Marmara region also including Ilıpınar, Menteşe, Marmaracık and Aktopraklık. Obviously, all fragments from Barcın belong to the deep and box-like type of "tables". This type has been discovered at this site already during D. French's surveys in the 1960s (French 1967, fig. 20,72, mentioned as "Yenişehir II") as well as in Marmaracık. The formal similarities in the pottery of Neolithic Barcın and the basal layers of Menteşe, as they have been observed by J. Roodenberg et al. (2008:56), can be confirmed in the case of the "cult tables" as well. Comparable fragments have recently been found there in burial UK (fig. 6) as well as in Ilıpınar and in Aktopraklık[4]. Another concentration can be observed in the Eskişehir Plain in high numbers in Demircihöyük and in Alyamak Höyük and Fındık Kayabaşı. Another concentration is to be related with the Fikirtepe Culture at the northern shores of the Sea of Marmara (Pendik and Fikirtepe). The only examples from Europe have been discovered during the 2007 campaign at Kırklareli in a pre-Karanovo I context and at Hoca Çeşme, layer 3. Single find spots in Central Anatolia are known from Sakarlar Höyük in the Konya Plain, Sapmaz Köy in the Aksaray region as well as from Köşk Höyük near Bor. Furthermore finds from Çoşkuntepe, Moralı and Akmakça show that the boxes have also been used in the catchment of the West Aegean coast. Meanwhile, in layer IV of Ulucak in the eastern suburbs of Izmir "cult tables" have also been discovered together with greenstone axes, figurines and pintaderas (Çilingiroğlu/ Çilingiroğlu 2007, vol. 1:365, vol. 2:350 fig. 10).[5] Therefore the thesis of a widespread distribution of the boxes all over West and Central Anatolia can be accepted. Intensified research in the previous years (e.g. Lichter 2006; Karul 2007; Çilingiroğlu and

[4] A study of the newly discovered "tables" from Aktopraklık on the eastern shore of the Ulubat Lake, excavated by Necmi Karul (Istanbul), will be presented separately by the author.

[5] The excavations at Ulucak revealed several more fragments which are not published yet. The same observations were made in recent campaigns at Ege Gübre. Kind informatons provided by Çiler Çilingiroğlu and Haluk Sağlamtimur, Istanbul March 3rd 2009.

Çilingiroğlu 2007; Roodenberg et al. 2008) has already focused this picture. Meanwhile the increasing number of examples outside the fringes of the Sea of Marmara makes the term "West Anatolian Type" instead of "Fikirtepe Type" seem more appropriate.

The surface treatment of the "cult tables" of Barcın Höyük is of good quality. Most of the fragments are of different brownish colours or black, well fired and slightly or highly burnished.

As far as it is possible to observe, the vessels are of square or rectangular shape and 5,5-9 cm of height. A complete wall is not preserved, but examples from other sites, e.g. Menteşe or Fikirtepe, show a length of 10-15 cm. A very small square box of 5,6 cm height and approximately 5 cm length (fig. 1,3) is of an unusual shape.

Four pieces (fig. 1,1-3; 3,3) show traces of handles which have been fixed mostly on the short sides of the tables. Good comparisions are known from Menteşe (fig. 6), Demircihöyük, Fikirtepe Pendik or Marmaracık (Schwarzberg 2005a, fig. 2,3.6.8-9; fig. 3,1-4). In some cases the handle may have formed a ring (fig. 1,2-3); one fragment was a short, conical handle. Band handles, like in the area at the Marmara coast, are unknown.

The legs are either roundish, oval or triangular. Only one fragment (fig. 1,1) has a short angular leg. Generally, the legs directly rise from the upper wall. In one case a leg is slightly retracted (fig. 3,3), as observed in Fikirtepe (Schwarzberg 2005a, fig. 2,1-4).

A high number of the Barcın Höyük tables are ornamented. Because the motifs are sometimes not applied all over the surface it is quite likely that some of the undecorated fragments initially belonged to ornamented vessels. The ornaments are mostly thinly incised. Only a few pieces show deep incisions (fig. 4,3.7.10) or stroked dots (fig. 1,3; 4,3.8.11). Chip-carved ornaments or plastic applications are completely absent.

Sometimes the ornaments are "framed" by a single line scratched along the rim or corner. This frame line can be separate or including the other motifs.

Chessboard motifs, which are quite common in the northern Marmara region (Schwarzberg 2005a, fig. 1,1-4), are absent at Barcın Höyük. Here, zigzag lines (fig. 1,3; 4,1-5), x-motifs (fig. 4,6.9.13), net motifs (fig. 1,2) and triangular motifs (fig. 1,1; 2,2; 4,12) dominate. They can be arranged on vertical or horizontal lines and filled with dots or crossing lines. Again, the best parallels are known from Menteşe (fig. 6) as well as from Demircihöyük (Seeher 1987, e.g. pl. 6,21; 16,36; 17,21.23.30; 18,3), Alyamak Höyük, Akmakça, Çoşkuntepe, Moralı, Sakarlar and Sapmaz Köy (Schwarzberg 2005a, fig. 3,2.6-12). The cross- or star-like ornament from a fragment collected in the 1960s by D. French (French 1967, fig. 20,72) has excellent comparisons with Demircihöyük (Seeher 1987, pl. 17,8-15; 18,4).

An interesting and so far unpublished deep corner fragment of approx. 7,2 cm height has been discovered at Ilıpınar, phase X (fig. 2,1). It is well burnished and has a straight wall. The surfaces A and B are decorated with an unframed fine incised ornament consisting of dot filled zigzag bands and circles. The piece was found at the big square near the burnt house at square W12/13.

Higly complex ornaments, e.g. with crosses (fig. 4,1.5) or triangles (fig. 1,3; 4,12) are limited at Barcın Höyük and have no comparisons. The occurrence of singular or locally limited motifs can be observed on several other sites in Anatolia and SE Europe.

In conclusion, the fragments from the Neolithic deposits at Barcın Höyük are excellent and early examples of the West Anatolian type of the so-called "cult tables". The closest ornamental and typological relations can be shown for pieces from Menteşe (Alpaslan-Roodenberg 2001) in the Yenişehir Plain and – mostly unstratified – Demircihöyük in the Eskişehir-Kütahya region (Seeher 1987). In contrast to the examples from the eastern Marmara region, the pieces with profiled, retracted legs, chessboard motifs and band handles known from the northern Marmara coast show a different local expression, although other pottery finds from Barcın Höyük seem to be more connected to the northern Marmara sites of Fikirtepe context.

The ^{14}C data of the stratified pieces from Barcın Höyük confirms the sample of Menteşe (Alpaslan-Roodenberg 2001:1) as well as the stratigraphical observations at Pendik (Özdoğan 1999:213) or Aşağı Pınar (own observations) and dates back the origins of this particular type of vessel to the beginning of the second half of the 7th millennium cal. BC.

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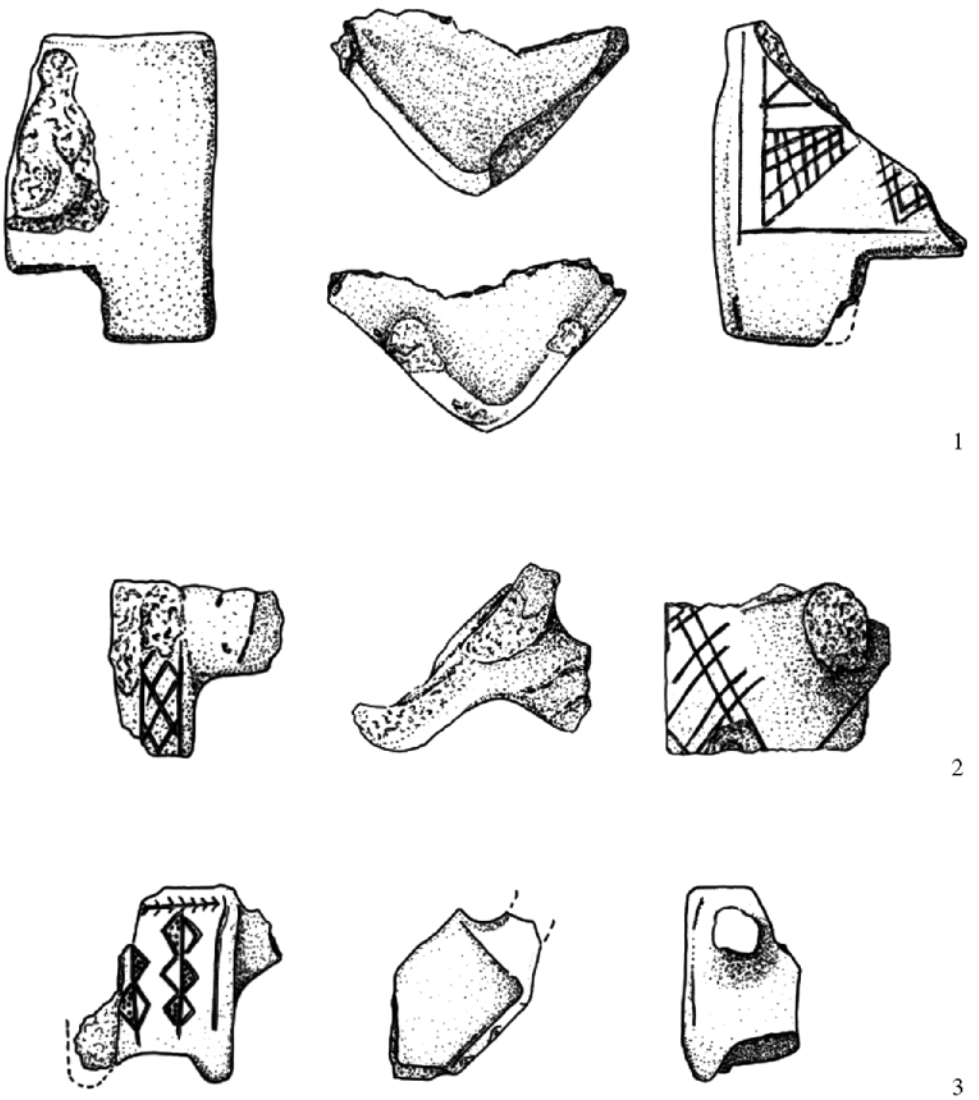

Fig. 1: Body and leg fragments of Neolithic "Cult Tables" from Barcın Höyük (scale ca. 1:2).

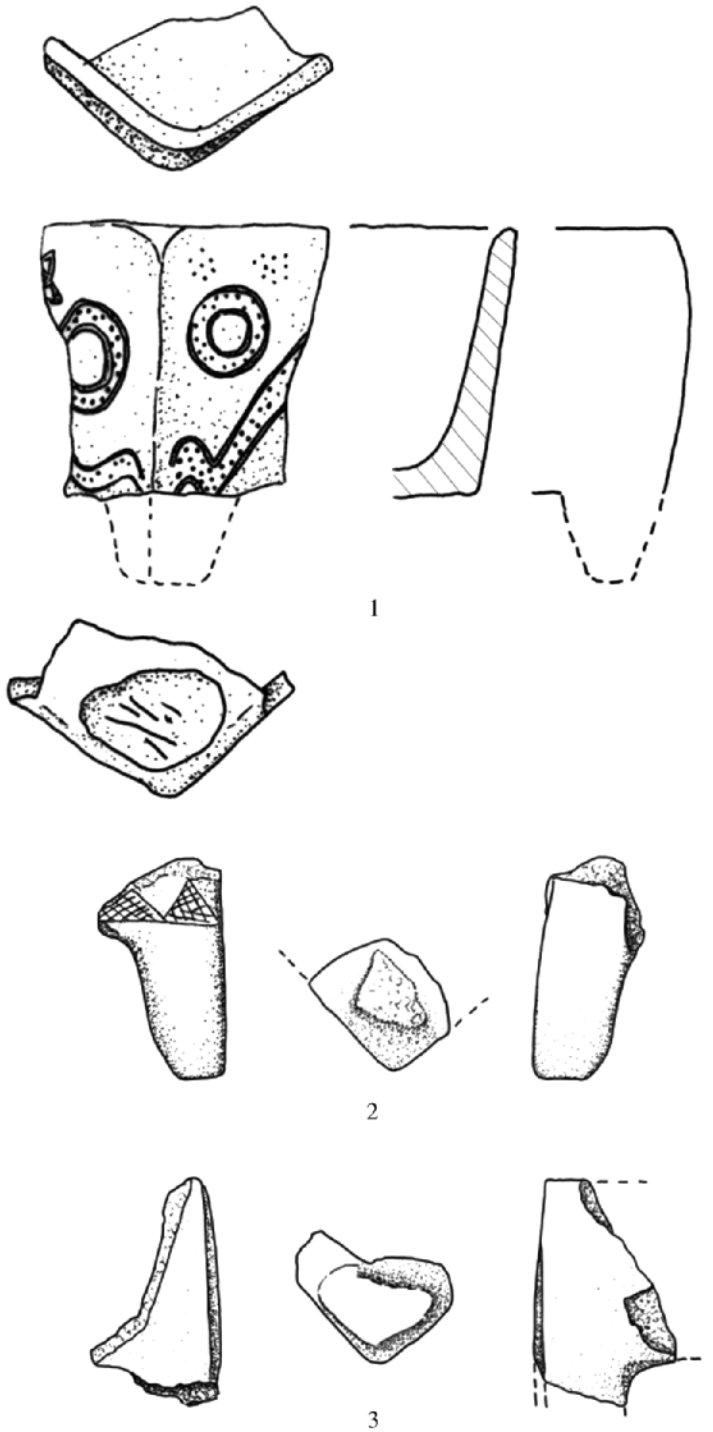

Fig. 2: Body and leg fragments of Neolithic "Cult Tables" from [1] Ilıpınar and [2, 3] Barcın Höyük (scale ca. 1:2).

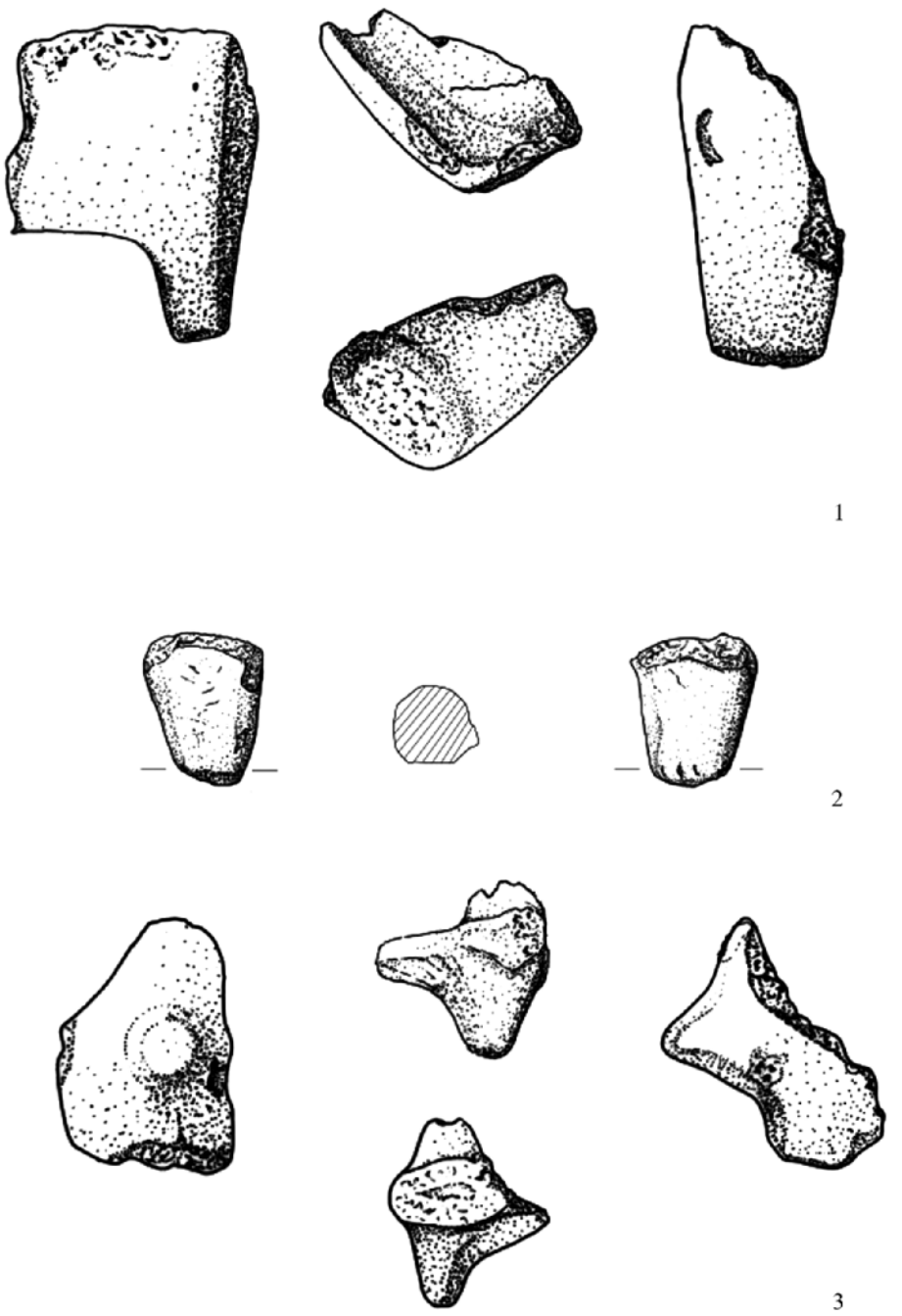

Fig. 3: Body and leg fragments of Neolithic “Cult Tables” from Barcın Höyük (scale ca. 1:2).

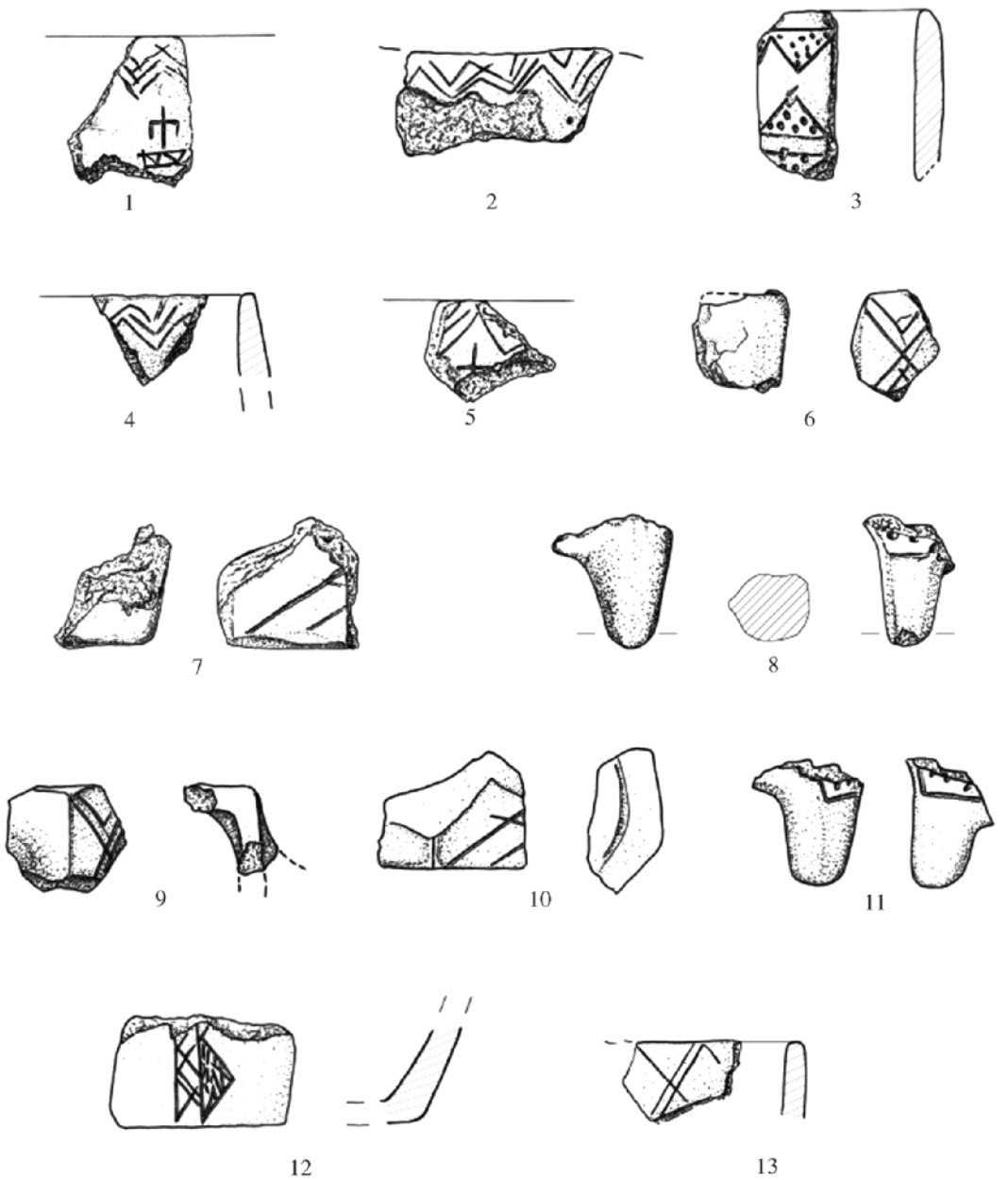

Fig. 4: Smaller body and leg fragments of Neolithic "Cult Tables" from Barcın Höyük (scale ca. 1:2).

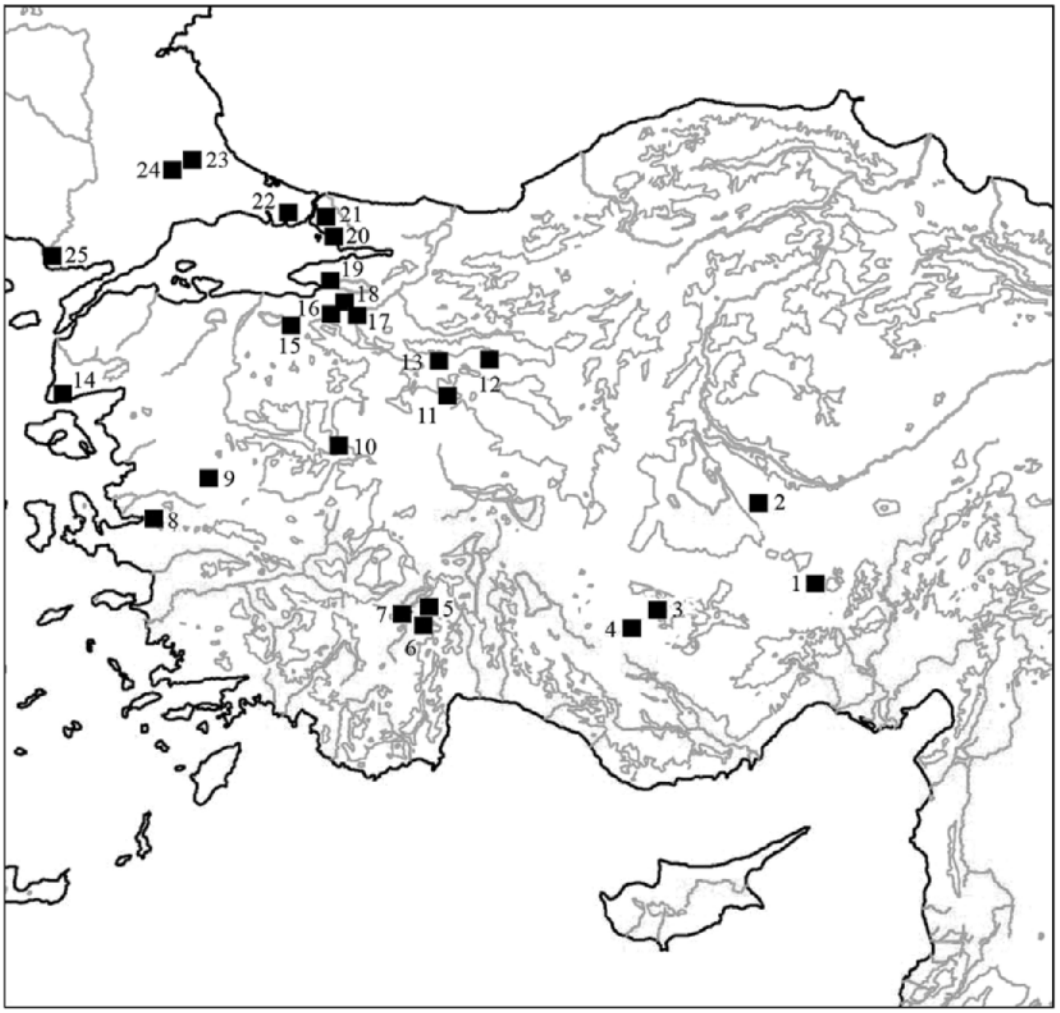

Fig. 5: Distribution of Neolithic and Chalcolithic"Cult Tables" in Central and West Anatolia and Turkish Thrace.

1 Köşk Höyük; 2 Sapmaz Köy; 3 Çatal Höyük; 4 Sakarlar Höyük; 5 Kuruçay;
6 Höyücek; 7 Hacılar; 8 Ulucak; 9 Moralı; 10 Akmakça;
11 Fındık Kayabaşı; 12 Alyamak Höyük; 13 Demircihöyük; 14 Coşkuntepe; 15 Aktopraklık;
16 Marmaracık; 17 Barcın Höyük (Yenişehir II); 18 Menteşe; 19 Ilıpınar; 20 Pendik;
21 Fikirtepe; 22 Yarımburgaz; 23 Kırklareli-Aşağı Pınar/Kanlıgeçit; 24 Yenimahalle; 25 Hoca Çeşme.

Fig. 6: A – Burial UK from Menteşe (after Alpaslan-Roodenberg 2001).

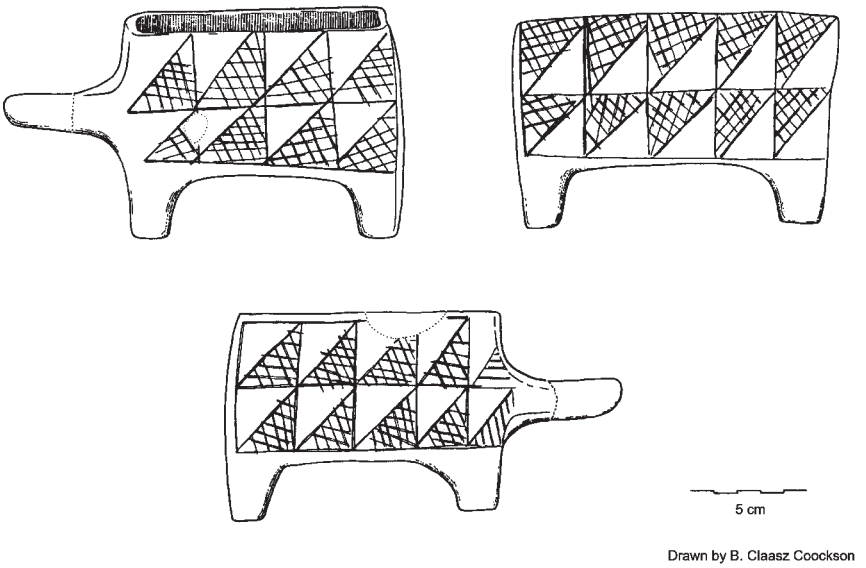

Fig. 6: B – "Cult Table" from Menteşe, burial UK.

ANATOLICA XXXV, 2009

CHALCOLITHIC CAPRINES, DARK AGE DAIRY, AND BYZANTINE BEEF: A first look at animal exploitation at Middle and Late Holocene Çadır Höyük, north central Turkey

Benjamin S. Arbuckle

INTRODUCTION

North central Anatolia, comprising the northern portion of the Classical province of Cappadocia, is well known archaeologically as the heartland of the Hittite empire and as such the Late Bronze Age of this region has been intensively explored for almost a century. Although research on the Neolithic and Chalcolithic of the southern central plateau has been active for decades, the prehistoric sequence in the northern part of this region is still largely a "blank slate" (Steadman, et al. 2007:385; although see Schoop 2005). As a result, key events, such as the development of increasingly complex pre-state societies in the Late Chalcolithic and Early Bronze Age as well as the Hittite collapse and the subsequent transition to the Early Iron Age are only poorly understood, particularly from a paleoeconomic perspective. Moreover, since Late Bronze and Iron Age centers have been the focus of much of the archaeological research in this region little is known about how agro-pastoral systems, the foundations on which such societies were built, were organized or how they responded over time to patterns of regional political centralization and decentralization, population movements, climatic crises, and social upheavals from the Chalcolithic onwards.

This paper focuses on addressing some of these gaps by presenting the first results of ongoing zooarchaeological work at Çadır Höyük, a multi-period mound site located in north central Anatolia (Yozgat, Sorgun, Turkey). Çadır presents a unique opportunity to examine the organization of the animal economy at a 'rural center' on the northern Anatolian plateau and to begin to frame these systems and their change over time in context of changes in the site's function and regional sociopolitical context through the middle and late Holocene. This report focuses on analysis of faunal remains from Late Chalcolithic, Late Bronze Age, Iron Age and also Byzantine contexts (see Table 1 for a summary of chronology). The primary goal is to outline the nature of the animal economy in these periods and to define its change through the stratigraphic sequence. A secondary focus is to begin to place faunal evidence from Çadır into a larger regional context.

BACKGROUND

Faunal work at Çadır is focused on defining the main patterns of animal exploitation through the long stratigraphic sequence and placing them within a larger regional sociopolitical context. Research has indicated that domestic animals, particularly

the ungulates, were likely important sources of power, prestige and wealth for emergent elites in increasingly complex transegalitarian societies as well as in early state level societies (Arbuckle 2006; Hayden 1996; Wattenmaker and Arbuckle 2004). The organization of systems of animal production thus provides a window into one aspect of the nature of social complexity at Çadır.

This perspective is used to address the nature of animal production at Late Chalcolithic (hereafter LC) Çadır. As an emerging local center in the LC, does the animal economy at Çadır represent a system focused on local subsistence-oriented production, like that seen at the rural Anatolian site of Kaman kale-höyük (Kirşehir, central Turkey) (Atıcı 2005; Hongo 1996), or is there evidence that animal production was geared towards a larger, more integrated regional economy in the form of intensive commodity production of fiber, meat, or dairy as is evident at the MBA center Acemhöyük (Aksaray, central Turkey) (Arbuckle 2006)?

Since the current faunal sample is limited to the late portion of the Bronze Age, questions also focus on understanding Hittite period animal exploitation at Çadır. Is there faunal evidence to support the hypothesis that Çadır was the site of the Hittite cult center known as *Zippalanda* (Gorny 2005, 2006a)? Concentrations of high status foods, the remains of feasting events, or the presence of an array of exotic fauna might indicate evidence for the special status of the site in the LBA.

The transition from the Late Bronze Age to the Iron Age is known as a 'Dark Age' across Anatolia (Fischer, et al. 2003) and a major question focuses on how this transition is expressed at Çadır. Did the collapse of the LBA system at the end of the second millennium BC have a ripple affect on rural communities such as Çadır or where such communities buffered from such top-down political shifts? Previous work has suggested that this major political breakdown had relatively little impact on local animal production systems at rural settlements such as Kaman kale-höyük and even at major centers such as Boğazköy and Gordion (Hongo 2003; von den Driesch and Pöllath 2003; Zeder and Arter 1994). Does Çadır fit into this pattern, or does evidence for a major reorganization of the animal economy in the Iron Age suggest that major changes in the function and status of the site took place (e.g., decline from a Hittite cult center) including the possible appearance of new populations?

Finally, this research addresses the nature of rural agricultural production in a Byzantine settlement located far from the empire's center. There is virtually no archaeological evidence for the organization of the agricultural economy in a rural Byzantine settlement on the Anatolian plateau (Steadman, et al. 2008). As a result the initial goal of work on Byzantine levels is to break new ground by defining the patterns of animal usage at just such a settlement.

The faunal remains from Çadır thus provide a valuable opportunity to address a series of important questions concerning the organization of the animal economy in the middle and late Holocene and its response to the major cultural changes that characterize this period.

THE SITE

Excavated under the auspices of the Alişar Regional Project directed by Ron Gorny since 1993, Çadır Höyük is a mound site located on the northern portion of the central Anatolian plateau in the Kanak Su basin in Yozgat Province, Central Turkey (Fig. 1) (Gorny 1994a, b; Gorny 1995; Gorny 2006a; Gorny, et al. 1995; Gorny, et al. 2000, 2002; Gorny, et al. 1999; Steadman, et al. 2007; Steadman, et al. 2008). The mound itself covers 4.4 hectares rising 32 meters above the surrounding plain, while a lower terrace covers as much as 40 more hectares mostly to the northeast. A decade of research at Çadır has uncovered a stratigraphic sequence representing nearly continuous occupation from the Middle Chalcolithic (c. 5200 cal BC) through the Byzantine period (c. AD 1100) (for recent summaries see Steadman, et al. 2007; Steadman, et al. 2008), offering a unique perspective on sociopolitical as well as economic change through a large portion of the middle and late Holocene (see Table 1 for periodization).

The LC settlement at Çadır has recently been summarized in detail (Steadman et al. 2007). Based on the results of regional survey as well as excavation, the site is one of several local centers to emerge in the fourth millennium BC in the Kanak Su Basin (Branting 1996; Gorny 1995; Gorny, et al. 1999; Steadman, et al. 2007). The excavated remains from LC Çadır include evidence for public architecture, an enclosure wall, domestic and nondomestic structures, and a rich artifact inventory suggestive of a thriving economic and perhaps political or ritual center. Evidence suggests the residents of the LC settlement were involved in small-scale bead, lithic, and textile production, while ceramics and a fine quality metal pin with parallels from the Arslantepe 'royal tomb suggest connections with a NE Anatolia/Transcaucasian interaction sphere (Steadman et al. 2007: 394, 400). In addition, recent analysis of butchery marks on animal bones suggests that metal (presumably copper) cutting tools were commonly used at LC Çadır, indicating a surprisingly early involvement of metallurgical technology in domestic tasks and further illustrating the wealth of the LC settlement (Adcock and Arbuckle 2009).

The faunal sample from the LC derives from excavation units on the southern slope of the mound, which have uncovered three types of architectural remains including 1) a domestic complex referred to as the 'burnt house and courtyard', 2) a well-provisioned nondomestic structure known as the 'omphalos building' for its characteristic dimple-bottomed bowls, and 3) the remains of a gateway and 'guard room' leading into the settlement (see Steadman et al. 2007 for a detailed discussion of these remains).

A Transitional period (LC/EB) marks the end of the LC at Çadır and is characterized by changes in architecture, most notably the rebuilding of LC structures with new orientations and the deterioration and alteration of the enclosure wall and gateway complex. Only a small faunal sample is currently available from these levels, which date to the final century of the fourth millennium BC.

The next period from which a sizable faunal sample is available is the Late Bronze Age (LB). Located within the heartland of the Hittite empire only c. 70 km from the capital of Boğazköy and even closer to the major site of Alişar, which was likely a Hittite period administrative center, a great deal of interest has focused on defining the nature of

the Çadır settlement during the Hittite period. It has been argued that Çadır may correspond to the cult site of *Zippalanda*, one of the most important cult centers in the Hittite empire (Gorny 2005, 2006a, b; although see Popko 2000).

Hittite period remains are known from the Step trench located on the east slope of the mound as well as from units on the south and north slopes. Excavation has revealed evidence for large-scale architecture including a large stone gate system on the north side of the mound and the remains of a thick mudbrick wall on the south slope, which may represent the boundary of the upper 'citadel' portion of the settlement (which is currently covered by Byzantine deposits). In addition, a badly preserved 'house' as well as pits and features associated with grain processing and storage have also been identified in the Hittite empire contexts.

The transition from the Late Bronze Age to the Early Iron Age is often referred to as an Anatolian 'Dark Age' and is poorly understood on the central plateau (see papers in Fischer et al. 2003). Extensive exploration of Iron Age deposits has revealed continuous occupation of the site through this transition and on through the entirety of the Iron Age (c. 1100-500 BC). Analysis of architectural remains suggests that following the collapse of the Hittite empire Çadır was neither abandoned nor can a strong argument be made for a replacement of the LB population (Gorny 2006a).

Contexts from which faunal remains derive have been described as "only partially domestic" (Gorny 2006a) and include outdoor areas near the south gateway into the settlement including plastered basins and pavements which likely functioned as work or perhaps market areas, as well as concentrations of spindle whorls and animal remains suggesting textile production and food processing activities (Gorny 2006a).

Byzantine remains, dating from the 6th through 11th centuries, mantle the top of the mound and are also found on the lower terrace at Çadır, although only faunal remains recovered from the mound are reported here. The Byzantine settlement at Çadır represents a small, rural agricultural community with evidence for a large stone wall surrounding the upper portions of the mound as well as the presence of large multi-story buildings, storage facilities, and a gated area used for penning animals. This final area was notable for a concentration of animal remains that may represent a catastrophic death event in which a large number of animals perished while locked in the enclosure, perhaps following a sudden abandonment of the settlement (Gorny 2006b). Çadır represents the only excavated small agricultural settlement on the eastern plateau dating to the Byzantine period and thus represents a unique source of information concerning the organization of animal economies in the rural hinterland.

THE FAUNAL ASSEMBLAGE

Methods

The faunal assemblage at Çadır was recovered through the application of multiple recovery techniques applied according to the nature of the contexts. Priority 1 contexts, including all sealed contexts, were screened using a 5mm screen and samples were taken

for flotation. Priority 2 (partially sealed) contexts were screened but not sampled for flotation, and priority 3 (mixed) contexts were screened in amounts ranging from 25-100%.

Faunal remains were analyzed in the field at the Çadır dig house (Peynir Yemez village) while a sample was also exported for analysis at the Baylor University Zooarchaeology Laboratory. Species identification in the field was accomplished with the aid of published sources, a database of digital images prepared by the author and with the help of colleagues, and a small comparative collection at the site. Although it was possible to identify most mammalian specimens to the family or genus level, most micromammals were simply recorded as belonging to the order Rodentia, and birds were recorded as large or small Aves. Future work will focus on the more specific identification of these taxonomic groups. Standard data (similar to those described in BONECODE (Meadow 1978)) describing taxa, element, location, fragment size, weight, evidence for age, sex, biometrics, as well as evidence for modification and alteration were recorded. Neither shaft fragments without diagnostic landmarks (see Stiner 2002) nor fragments that could not be identified to skeletal element were recorded.

Quantification

The relative frequencies of taxa in the assemblage were calculated based on specimen counts (Table 2) as well as diagnostic zones (Table 3). Diagnostic zones are defined as described in Russell and Martin (2005:37) (but including features of limb shafts as described in Stiner (2002)) and include the most identifiable skeletal portions that are represented in all of the major taxa. They are used in order to remove some of the biases inherent in the use of raw specimen counts or NISP, particularly those relating to fragmentation and differential identifiability of some elements of some taxa (e.g., Grayson 1984; Lyman 1994).

Biometrics

Biometric data provide a useful line of evidence for interpreting the nature of animal exploitation strategies including sex and age specific slaughtering patterns that can be used to reconstruct the goals of herd management as well as the continued presence of hunting within post-Neolithic agricultural communities (Albarella 2002; Helmer 1995; Uerpmann 1978; Zeder 2001). Since the number of measurable specimens was relatively small for each of the main taxa for each stratigraphic period, biometrical data were examined using the Log Size Index, or LSI, method. Using this method, log (base 10) transformed measurements taken from archaeological specimens representing multiple skeletal elements are compared with the corresponding measurements from a standard animal. The standards used in this study correspond to those commonly used in the Near Eastern zooarchaeological literature and include a modern female *Ovis orientalis* from Iran, the averaged measurements of modern male and female *Capra aegagrus* specimens from the Taurus mountains in Turkey (following Uerpmann and Uerpmann 1994), a large female aurochs from Mesolithic Denmark (Degerbol and Fredskild 1970; Grigson 1989; Russell and Martin 2005; Russell, et al. 2005), a modern female wild boar from

southeastern Turkey (Hongo and Meadow 1998), and a modern donkey (*Equus asinus*) (from the Baylor University Archaeology lab).

This method has the benefit of allowing measurements from multiple skeletal elements to be examined together on one graph. Although there are some potential problems with using animals from different regions and periods as standards, including the potential for nonallometric variation in skeletal dimensions between the standard and the archaeological population (Meadow 1999; Russell, et al. 2005; Zeder 2001), these are relatively minor.

In addition, whenever possible LSI values are presented for both fused and unfused specimens. Fused specimens represent animals that were slaughtered after fusion of long bone epiphyses and represent subadult or adult individuals, while unfused specimens represent yearlings or subadult animals whose growth plates have not yet fused. In species that exhibit sexual dimorphism (including most ungulates) comparing the size distributions of fused and unfused specimens provides a valuable means to monitor the size and therefore sex of animals slaughtered at older and younger ages and to therefore interpret the ultimate production goals of herd management (Zeder 2001, 2006a).

Demographics

Demographic profiles, representing the age at which animals were slaughtered, in combination with biometric data, are key for understanding how herds were managed, for what products, and the nature of provisioning systems. Demographic data are derived from two sources including the state of fusion of the epiphyses of long bones, and the eruption and wear of mandibular teeth.

The timing and sequence of epiphyseal fusion is fairly well documented for domestic ungulates and the calculation of the percentage of specimens representing specific skeletal portions (e.g., distal humerus) with fused epiphyses are used to construct survivorship curves (Hongo 1998; Silver 1969; Zeder 2006b). Tooth wear was recorded for caprines following Payne (1973) and for cattle and pigs following Grant (1982) and demographic profiles were generated from these data following Payne (1973) for caprines and Hongo (1998) for pigs.

Skeletal part representation

The relative abundance of different portions of the skeleton, including the head, axial skeleton, forelimb, hindlimb, and extremities were calculated for the most abundant taxa. Skeletal part representations are useful for interpreting the mode of animal exploitation and for exploring the nature of butchery and consumption activities within a site (Becker 2002; Perkins and Daly 1968; Wattenmaker 1998; Zeder 1991). In particular the relative abundance of meat-rich skeletal elements as opposed to those associated with butchery waste (often heads and feet) have been used to explore evidence for provisioning systems as well as status differences within and between sites (Crabtree 1990; Piggott 1962; Stein 1986; Zeder 1991).

Skeletal part frequencies were generated by calculating the minimum number of skeletal elements (MNE) and standardizing first in reference to the number of elements present in a skeleton (Binford's (1984) MAU) and then for the number in each anatomical region (e.g., head, forelimb, etc.) (Arbuckle 2006; Stiner 1994:240). These results are then compared to the expected frequencies in a complete ungulate carcass.

COMPOSITION OF THE ASSEMBLAGE

In total 2418 specimens were recorded from contexts throughout the stratigraphic sequence at Çadır. The faunal assemblage is dominated by the remains of domestic taxa, although wild animals are present in significant numbers particularly in the LC deposits. With the exception of the Byzantine levels, sheep and goats (caprines) are the most abundant taxa followed by cattle and pigs based on specimen counts. In the Byzantine levels, cattle dominate the assemblage with pigs and caprines serving as distant secondary and tertiary resources. Changes in the frequencies of these taxa through the stratigraphic sequence are described in detail in the sections below.

In terms of taxonomic diversity or richness, the LC assemblage is notable for including the broadest array of wild taxa while at the opposite end of the spectrum the Byzantine assemblage in notable for its extreme lack of taxonomic diversity (Fig. 2; Table 2).

Taphonomy

Taphonomic biases have been identified as important factors that affect the validity of interpretation and comparability of faunal data (Bar-Oz 2004; Brain 1981; Munson and Garniewicz 2003). Although a detailed taphonomic analysis is beyond the scope of this initial report, multiple lines of evidence were pursued as a way to examine the impact of taphonomic factors on the faunal assemblage at Çadır. These include calculation of indices of taphonomic destruction, fragmentation, and quantification of evidence for modification (Table 4).

Estimates of assemblage fragmentation based on a completeness index, average recorded specimen size and weight are presented in Table 4 for both medium and large mammals, as are data describing the frequency of evidence for carnivore modification.

The completeness index (after Marean 1991) describes the completeness of all medium mammal astragali, second phalanges, and petrosals using five categories: (1) 0-25% complete; (2) 25-50%; (3) 50-75% complete; (4) 75-99% complete; and (5) 100% complete. Since these elements are relatively small and do not contain significant nutritional value, damage to them is likely to reflect natural transformation factors such as carnivore gnawing, abrasion, and chemical weathering within the soil rather than cultural factors such as butchery. The LC, LC/EB, LB, and Iron Age assemblages all produced very similar completeness scores (2.23-2.38) indicating exposure to similar taphonomic processes while the score of 3.09 in the Byzantine assemblage indicates a reduced exposure such processes.

Fragmentation indices indicate that the LC assemblage is characterized by the highest degree of fragmentation with the smallest mean values for recorded fragment length (46.8 and 66.5 mm) and weight (6.3 and 27.4 grams) for both medium and large mammal categories. The degree of fragmentation decreased in the Iron Age and again in the Byzantine deposits, which exhibit the largest mean dimensions. Since the vast majority of fragmentation occurred on fresh bone, this suggests that the intensity of carcass processing was most intense in the LC and generally decreased through time.

Evidence for carnivore modification in the form of gnaw-marks and evidence for digestion were noted in every period indicating that dogs were likely an important factor in the creation of the Çadır faunal assemblage. Evidence for carnivore activity is lowest in the Byzantine assemblage, where only 1.5% of specimens were affected and highest in the LC/EB levels where 6.3% of the small sample was affected.

TAXA

Caprines (*Ovis aries* and *Capra hircus*)

Frequency

Both domestic sheep and goats are well-represented in the Çadır faunal assemblage. As is the case in most assemblages from early and middle Holocene Anatolia, caprines are generally the most abundant taxa represented in the Çadır faunal assemblage, comprising between 48.2-35.7% of specimens identified to the genus level in each stratigraphic level (although only 16.6% in the Byzantine) (Fig. 3; Table 3). They are most abundant in the LC and Iron Age levels, are less well represented in the small Early Bronze and Late Bronze assemblages and then represent only a very minor component of the Byzantine remains. Although caprines are represented in equal frequencies in the LC and Iron age assemblages, the higher ratios of caprines to other domesticates (cattle and pigs) indicates that sheep and goats were the focus of the LC economy to an extent not seen in later periods, where lower ratios of caprines to cattle and pig indicate that caprine husbandry was integrated into a more balanced economic system in the Early and Late Bronze Age and Iron age levels (Table 3).

Sheep and goats are represented in approximately equal numbers throughout the assemblage although there are fluctuations through time. Goats slightly outnumber sheep in the Chalcolithic and Iron Age while sheep are more abundant in the LC/EB and in the Byzantine levels (Table 3).

Metrical data

Sheep

LSI values for Çadır sheep are presented for both fused and unfused specimens in Fig. 4. In addition, comparable data are presented from the Middle Bronze levels of the site of Acemhöyük (Aksaray, central Turkey) (from Arbuckle 2006). Overall, the sheep at Çadır show a decrease in size over time. A one-way ANOVA test suggests that this decline is statistically significant (df=59, F=4.272, p=0.0087), and a Tukey posthoc test

for inter-group comparison indicates that the LSI values for the LC sample are significantly larger than the Iron Age and Byzantine samples ($p<0.01$).

In the LC levels, it is notable that the median LSI value is similar to that of the standard, a wild female mouflon, indicating a surprisingly large-bodied population of domestic sheep. The size range of the sheep attested at LC Çadır overlaps considerably with that of the wild mouflon and it is therefore possible that some of these larger specimens may represent wild individuals. However, similarly large-bodied domestic sheep are known from central Anatolia in the Bronze and Iron Ages at Acemhöyük (see Fig. 4) and Kaman kale-höyük (Hongo 1996: Fig. 3.11.3). As a result, it seems likely that all, or at least most, of the large *Ovis* specimens represent large-bodied domestic sheep (*Ovis aries*).

The distribution of sheep LSI values in the LC is bimodal with one group of large-sized individuals, presumably representing large rams, and a group of smaller-bodied individuals that includes males/females slightly smaller than the standard as well as a group of very small females. Unfused specimens representing immature individuals are represented in the large and moderate-sized groups but not the smallest-sized group indicating that it was the larger males that were targeted for slaughter at a young age.

The presence of a significant number of large-sized, fused specimens at LC Çadır is important because it indicates that rams and/or wethers (castrates) were kept in fairly large numbers, a situation that is not typical of generalized herding economies focused on the production of meat, milk, and modest amounts of wool/hair (Bates 1973; Halstead 1998; Payne 1973). This pattern of extended male survivorship is comparable to the situation identified at MBA Acemhöyük (Aksaray, central Turkey), where it was interpreted as representing intensive wool production (Arbuckle 2006). Because large numbers of rams and wethers are not needed for herd reproduction and because these animals compete with reproductive females for grazing and fodder resources, this strategy indicates that LC herders were willing and able to invest significant resources in the production of wool as a (surplus?) commodity. The fact that caprines peak in abundance and importance in the LC further suggests that this system of wool production was a significant focus of the economy.

The small sample of biometric data from the Late Bronze Age suggests that large, young males were again the focus of slaughter. However, in contrast to the LC levels, and perhaps surprisingly given the potentially special status of the site in the Hittite period, there is currently no evidence for the presence of large adult rams or wethers being involved in wool production. This is also the case in the Iron Age, where the sample size is much larger.

In the Iron Age assemblage, median sheep size is significantly smaller than in the LC with only a few specimens larger than the standard attested. Most adult sheep harvested in the Iron age settlement represent adult females, while the generally large-size of unfused specimens and the dearth of large, fused specimens indicates that males were slaughtered before reaching maturity or else were not consumed onsite. This is suggestive of a more generalized, multi-goal-oriented management system that utilized sheep for meat, milk, and wool in contrast to the more intensive commodity production in the LC.

In the Byzantine levels, sheep size again declines with only small-sized individuals present, likely representing a smaller breed. Representing only c. 10% of the remains identified to the genus level in this period sheep were a very minor component of the Byzantine agricultural system at Çadır. As in the Iron and Bronze Ages there is no evidence for the intensive use of herds for any single product but rather the small sample is suggestive of small-scale household herding for meat, milk, and some wool.

Mean LSI values for fused sheep specimens are presented for individual skeletal parts for LC and Iron Age samples in Figure 5. The skeletal parts presented fuse at increasingly advanced ages (from left to right), and therefore represent the mean size of sheep in increasingly old age categories. Since caprine skeletons approach adult proportions by the end of the first year (Zeder 2001) it is expected that the size variations following the fusion of the distal humerus (at c. 9 months) are primarily the result of differences in the proportion of males and females in the fused sample.

In the LC as well as at MBA Acemhöyük, mean size is generally large, especially for late fusing skeletal parts (distal metapodials, calcaneum/distal radius) suggesting the presence of significant numbers of large males in the adult population likely used for wool production. At Iron Age Çadır and at Neolithic Köşk Höyük, however, mean values for sheep are much smaller and tend to decline in later fusing skeletal parts indicating that the proportion of large males decreases with age in the adult population. This pattern is expected in situations where meat and milk are the focus of production and excess males are slaughtered young. These data support the results seen in the total LSI dataset (Fig. 4) suggesting major differences in the goals of sheep production at LC and Iron Age Çadır.

Goats

Biometrics and horncore morphology suggest that the goat remains at Çadır represent domestic individuals (*Capra hircus*). Median LSI values for goats decrease through the stratigraphic sequence, although these changes are not statistically significant (one-way ANOVA: df=60, F=1.126, p=0.35). In the LC, goats were biometrically similar to the populations at MBA Acemhöyük (Fig. 6) and also Kaman kale-höyük (Kirşehir, central Turkey) (Hongo 1996:Fig. 3.11.6). As was the case for sheep, the presence of both fused and unfused, large-sized specimens indicates that although young males were targeted for slaughter, more male goats were allowed to survive into adulthood than are typically needed for herd reproduction. This suggests that goats, in addition to sheep, were likely used for the production of fiber in addition to meat and milk. These large adult males are more rare in the LB, Iron and Byzantine assemblages suggesting that the slaughter of young males was more intense in these periods and conversely production of goat hair was less of a concern.

In the Iron Age, the range for goat LSI values is wide. Moreover, the modal size of goats declined compared to the LC and Late Bronze Age, very small-sized individuals appear for the first time, and the largest-sized rams, well attested in the LC layers, are mostly absent suggesting significant changes in management goals and/or in the animal population at this time.

In the Byzantine levels, the majority of fused specimens exhibit low LSI values, indicating that females were culled as adults while the presence of only two large

specimens (one fused and one unfused) show that few males were allowed to survive to adulthood. This suggests that males were regularly subject to slaughter before reaching maturity, and in combination with the small number of goats kept in the Byzantine period, is characteristic of a small-scale, nonintensive, household-based herding system.

Survivorship

Demographic data are presented in the form of survivorship curves based on state of fusion of the long bones (Fig. 7; Table 5) and dental eruption and wear (Fig. 8; Table 6) for combined sheep and goats. Although it has been shown that sheep and goats were often subject to different management strategies (i.e., were used for different products) (Arbuckle et al. forthcoming; Redding 1981; Vigne and Helmer 2007) sample sizes are currently not robust enough to calculate survivorship for sheep and goats separately. The currently available data, however, do provide valuable information about how herds were managed and for what products.

Although most often used to reconstruct herd management strategies (Greenfield and Fowler 2005; Payne 1973; Redding 1981a; Vigne and Helmer 2007), Crabtree (1990) and others (e.g., Wattenmaker 1998; Zeder 1991) have pointed out that survivorship data, particularly in the context of complex societies, may reflect systems responsible for provisioning urban or smaller-scale settlements and therefore only provide an indirect picture of production strategies themselves. As a result, survivorship data are interpreted with both production and provisioning strategies in mind (following Stein 1986; Wapnish and Hesse 1988; Wattenmaker 1998; Zeder 1991). Models for identifying provisioning strategies define the expected faunal correlates for provisioning systems including both 'consumer' sites, characterized by concentrations of marketable animals (primarily young males), and 'producer' sites featuring concentrations of less marketable animals including those older females necessary for herd reproduction. Although provisioning systems have generally been addressed only within urban contexts, it is also possible that rural centers developed similar systems, if smaller in scale.

The general picture produced by the demographic profiles is one in which caprines were slaughtered at a relatively advanced age in all periods at Çadır, a trend identified in many but certainly not all middle and late Holocene settlements in Anatolia (e.g., Bronze and Iron Age Boğazköy (von den Driesch and Boessneck 1981); EBA Aphrodisias (Crabtree and Monge 1986); EBA Karatas-Semayük (Hesse and Perkins 1974); MBA Acemhöyük (Arbuckle 2006); EBA and Iron Age Sos Höyük (Howell-Meurs 2001); Iron Age Kaman kalehöyük (Hongo 1998); Hellenistic Sagalassos (De Cupere and Waelkens 1998); but not LC Aphrodisias (Crabtree and Monge 1986); LC and EBA Arslantepe (Frangipane and Siracusano 1998); Bronze Age Korucutepe; EBA and MBA Tilbesar (Berton and Mashkour 2008) or EBA and MBA Demircihüyük (von den Driesch and Boessneck 1987)).

Survivorship generated from fusion and tooth wear is consistently highest in the LC followed by the Iron Age and then Byzantine assemblages. Mortality curves generated from tooth wear data are presented in Figure 8 for Çadır caprines and compared with those for sheep from Neolithic Köşk and MBA Acemhöyük. The Köşk curve is

representative of management focused on the fairly intensive production of meat (especially lambs) and probably also milk, while sheep herding at Acemhöyük is thought to have focused on wool production in addition to meat and milk (Arbuckle 2006; Arbuckle, et al. forthcoming). Clearly, the curves generated for the LC, Iron and Byzantine assemblages all cluster around the Acemhöyük wool profile with 63-43% of caprines surviving past their second year compared to only 15% at Neolithic Köşk. Survivorship curves generated from fusion data (Fig. 7) confirm this slaughter schedule with 71% and 48% surviving past two years in the LC and Iron Age. Both datasets show marked differences in the age of slaughter in the LC, where very few older yearlings were slaughtered, and Iron Age, where yearlings were more intensively exploited. This emphasis on delayed slaughter in the LC supports the biometric data in suggesting that very different systems of caprine management were in place in the LC and Iron Age, with the former system focused more on the production of wool and the latter on a combination of products including meat and perhaps milk and wool.

Alternately, it is also possible that the demographic results including changes over time reflect shifts in provisioning systems rather than, or in addition to, changes in management strategies. The emphasis on adult caprines at Çadır might suggest that it was a 'producer' economy in which expendable young males are transported to and consumed at larger regional centers, perhaps Alişar Höyük. This would suggest a high degree of regional integration even in the LC with Çadır herders producing for growing regional markets. However, regional survey has indicated that in the LC Çadır was one of three local population centers in the Kanak Su basin, suggesting that Çadır was more likely to be a 'consumer' site rather than a 'producer' feeding other larger settlements. The absence of either a clear consumer or producer pattern at Çadır, along with the relatively rural nature and modest size of the site suggest that the animal economy was primarily self-sufficient. As a result, demographic data are probably a fairly good indicator of local strategies of animal production rather than reflective of specialized provisioning systems.

Although yearling caprines were not intensively targeted for slaughter at Çadır, the presence of perinatal remains in the LC and Iron Age assemblages, the remains of animals slaughtered as young lambs/kids (<6 months), as well as shed deciduous teeth (in F54 and F58 in trench 770.890) indicate that caprines were present onsite in the spring and summer months. Moreover, dental data showing an early peak in slaughter between 6-12 months indicate that a portion of each cohort of yearlings was slaughtered just prior to, or during, their first winter. Older yearling were also culled in the Iron and Byzantine periods but appear not to have been exploited in the LC. Overall, the survivorship data suggest that, although a portion of each cohort was culled as lambs, the emphasis in all periods was on culling adult sheep and goats, suggesting that fiber and keeping an adequate stock of breeding females were important concerns rather than the intensive production of meat and milk (as seen at Neolithic Köşk Höyük). However, the emphasis on fiber production peaked in the LC and perhaps the Late Bronze, declined in the Iron Age, and finally developed into a small-scale multi-resource management system in the Byzantine period.

Skeletal part frequencies

The representation of portions of the caprine skeleton is presented for LC, Iron Age, and Byzantine levels in Figure 9. This figure presents deviations in observed frequencies from those expected in a complete carcass. Negative values therefore represent under-representation of portions of the skeleton while positive values indicate over-representation.

The overall pattern of skeletal part representation at Çadır is one in which the remains of heads and forelimbs are over-represented while the axial skeleton, hindlimbs and distal extremities (feet) are under-represented. These results are broadly similar in all periods. The representation of anatomical regions correlates roughly with average bone density values for each region, indicating that density-mediated attrition is likely a major factor responsible for the overall "valley and peak" shape of the curve.

The remains of heads and feet are often classified as representing butchery waste, while the remains of nutrient-rich limb bones are often identified as consumption waste (Crabtree 1990; Wapnish and Hesse 1988; Zeder 1991). By monitoring the representation of these types of remains, this model can be used to evaluate the degree of spatial segregation between butchery and consumption activities. A high degree of segregation in these activities might be indicative of a complex provisioning systems in which cuts of meat were distributed through centralized or specialized mechanisms, while a low degree of segregation suggests that butchery of consumption took place together in the same location(s).

Although the overprint of taphonomic processes hampers interpretation of these data, there is no indication that the portions of the LC, Iron or Byzantine settlements that have been explored were provisioned with specific cuts of meat or that butchery and consumption were segregated in any significant way. Given the abundance of heads and the relative over-representation of foot remains in the LC and Iron Age compared to the site-wide average, as well as the abundance of the remains of the appendicular skeleton it is likely that entire carcasses were butchered and consumed onsite, in all periods. Together with the demographic data, this suggests that specialized provisioning systems, of the kind identified in Bronze Age urban centers such as Acemhöyük or Malyan (Arbuckle 2006; Arbuckle, et al. forthcoming; Zeder 1991), were likely absent at Çadır.

Cattle (*Bos taurus* and *Bos indicus*)

Two species of cattle are likely represented at Çadır Höyük. In the absence of clear morphological evidence to the contrary the large bovid remains from the LC, Bronze and Iron Age deposits are thought to represent taurine cattle, *Bos taurus*. In the Byzantine levels, however, two examples of thoracic vertebrae with bifurcated neural spines were identified (locus 6 in trench 810.900). This feature is suggestive of the presence of indicine or zebu cattle (*Bos indicus*). Indicine cattle, native to South Asia, have occasionally been identified in the southern Levant from the Late Bronze/Iron Age and Hellenistic contexts (Clason 1978; Wapnish and Hesse 1991) (Clason 1978; Wapnish and Hesse 1991:3), presumably arriving via trade routes connecting the Near East with

South Asia (Bradley and Magee 2006). Their presence at Çadır highlights the location of the site along a significant east-west trade route.

Cattle are the second most abundant taxa representing 12-25% of the specimens identified to the genus level in the LC, LC/EB, LB and Iron Age deposits while they dominate (60%) in the Byzantine levels. Cattle increase in abundance from the LC into the Bronze Age and then decline somewhat in the Iron Age as attested by a drop in relative frequency and an increase in the ratio of caprines to cattle (Table 3).

Because of their large size, multiple uses, and high symbolic as well as economic value, an abundance of cattle has often been associated with high status and/or cultic activities/locations as well as intensive agricultural production (Russell, et al. 2005; von den Driesch and Boessneck 1981; von den Driesch and Pöllath 2003; Zeder 1991). If changes in the frequency of cattle at Çadır as used as a rough proxy for site status and wealth, the increasing frequency of cattle in the Bronze Age and its subsequent decline in the Iron Age may parallel the changing fortunes of the site leading up to and following the Hittite period.

Metrical data

LSI values for Çadır cattle are presented in Figure 10 for fused and unfused specimens and compared with early domesticates from Pottery Neolithic Erbaba Höyük (Beyşehir, west central Turkey). Cattle from Çadır are very small in stature and clearly represent morphological domesticates. Median size fluctuates through time decreasing dramatically from the LC and Bronze Age to the Iron Age and then increasing again in the Byzantine period. A one-way ANOVA test indicates significant differences in size between stratigraphic levels in the assemblage ($df=106$, $F=5.093$, $p=0.0025$), although due to limited sample sizes a Tukey post hoc test only indicates a significant difference between the Iron and Byzantine assemblages ($p<0.01$).

In the LC and Late Bronze Age assemblages, LSI values are strongly bimodal; the one unfused specimen in the LC is large indicating that some males were culled before reaching maturity. However, most fused specimens are on the large end of the size range, indicating that many males were culled as adults. Since male cattle are expensive to maintain and only a few are necessary for herd reproduction, it is likely that they were regularly used for traction, with carts/sledges and/or plows. However, foot pathologies indicative of the regular use of cattle for traction (De Cupere, et al. 2000) were not identified in the small sample of LC and Late Bronze foot bones ($n=24$).

The transition to the Iron Age marks a major shift in the size of cattle at Çadır that may indicate both the appearance of new animal populations as well as new systems of herd management. Although still maintaining a roughly bimodal distribution, LSI values are highly skewed towards small individuals and median size is the lowest of any period. In addition, extremely small individuals appear for the first time, while large adult males are only poorly represented. In contrast to the situation in the previous levels these data indicate that adult females dominated among those animals slaughtered and consumed as adults, while males were likely primarily slaughtered at younger ages (or perhaps adult males simply were not consumed onsite). This decrease in large males is suggestive of

less intensive use of cattle for traction; however, pathologies in foot bones often associated with traction appear for the first time in the Iron Age (6.3%, N=48 metapodial and phalanx specimens). Thus it is possible that female cattle were used for milk, meat and also traction as has been argued to be the case elsewhere in the Mediterranean basin (Isaakidou 2006).

In the Byzantine period, LSI values indicate a dramatic increase in median cattle size. Although the presence of large-sized unfused specimens indicates that young males were occasionally slaughtered, as in the LC and Bronze Age, large male specimens are well represented suggesting that they were regularly used for traction. The prevalence of pathologies in foot bones (8.3%, N=58) supports this. In addition, the two largest cattle specimens appear in the Byzantine levels (representing a distal metacarpal and proximal scapula). These specimens fall into the size range of the Near East aurochs (*Bos primigenius*) and may represent a small remnant population surviving in the region. Alternately, since the Byzantine population likely represents a different genetic stock from those of pervious phases and includes indicine cattle, the two large-sized outliers may represent very large domestic bulls.

Age data

Survivorship curves generated from long bone fusion are presented for cattle in Figure 11 (Table 7) for LC, Iron and Byzantine levels. In the LC and Iron Age levels survivorship is generally very high through the first two years (80-88.9%) indicating that few calves were culled before reaching adult size. However, most cattle in the LC were culled before the fusion of the latest fusing skeletal parts (c. 3.5 years) similar to the situation documented in the MBA levels at Kaman kale-höyük, while survivorship is twice as high for this age cohort in the Iron Age. In the Byzantine levels, few calves were slaughtered but survivorship is considerably lower than in the previous levels with an emphasis on culling (mostly male) cattle between 18-24 months (50%), just before their second winter, and then between 2-3.5 years (23.7%). This pattern is very similar to that documented in the Ottoman levels of Kaman-kalehöyük (Hongo 1996).

Skeletal parts

Skeletal part distributions for cattle at Çadır exhibit a "valley and peak" pattern similar to that for caprines (Fig. 12). In most cases heads are represented at approximately expected frequencies while limbs are over-represented and axial skeleton and feet are under-represented. As with caprines, this pattern is correlated with bone density and likely reflects density mediated attritional processes.

In LC and Byzantine levels curves are generally similar to the site-wide pattern of skeletal part survivorship. All parts of the skeleton are present including both high and low utility skeletal parts. In the Byzantine deposits axial elements are better represented than the site-wide average indicating less exposure to dog-gnawing and other taphonomic processes (as indicated in Table 4).

The Iron Age assemblage exhibits the most distinctive pattern of skeletal part frequencies. In these deposits, although heads are represented in expected frequency, the

remains of feet are grossly over-represented and meat-bearing bones are relatively under-represented compared to other levels. This pattern is suggestive of concentrations of butchery remains, whereas the data from the LC and Byzantine levels represent higher proportions of consumption waste. These differences likely reflect changes in the types of activities taking place onsite in the Iron Age settlement, particularly those associated with large mammal butchery.

At LC and Byzantine Çadır there is little evidence for the segregation of butchery and consumption activities. The entire carcass was likely processed, consumed and disposed of by the residents occupying the mound. In the Iron Age settlement, however, the concentrations of butchery waste in trench 790.890 indicate a greater degree of spatial segregation between butchery and consumption. Primary butchery of cattle and the disposal of the resulting waste seem to have taken place in 'dirty' areas of the mound adjacent to the south gateway, while the butchered joints of meat were consumption and disposed of elsewhere in the site. This evidence for increased segregation between butchery and consumption activities is interesting and perhaps suggestive of a significant reorganization of the provisioning system as well as the use of space within the Iron Age settlement.

Pig (*Sus scrofa*)

Pigs' distinctive physiological characteristics including relatively high water requirements, omnivorous diet, low mobility, and high fecundity make them unique among Near Eastern domesticates (Grigson 2007; Zeder 1998). Because of these traits, and perhaps also because also their 'special' status as a pariah animal in the ancient and modern Near East (Albarella, et al. 2007; Collins 2006; Nelson 1998), pigs are often interpreted in Near Eastern sites as representative of a strictly household-based resource, the abundance of which is inversely related to status and degree of political centralization (Collins 2006; Zeder 1991). As a result, pigs are often poorly represented in faunal assemblage representing urban, high status, and cultic contexts in Anatolia, while they tend to be more abundant in rural settings, especially in better-watered environments.

Hittite sources indicate that pigs were generally regarded as unclean and low status animals, although they also played a role in specific rituals, some of which included the consumption of pork (Collins 2006). Despite their low status, texts, in combination with archaeological remains, indicate that pigs were a ubiquitous feature of Anatolian settlements from the Neolithic through Ottoman times and were an important part of subsistence strategies at Çadır in all periods.

Frequencies

Domestic pigs are the third most abundant taxa represented at Çadır, ranging from a low frequency of 10.7% in the LC to a high of 18.7% in the Byzantine levels. Pigs were least important in the LC as measured by frequency and the ratio of caprines to pig but increase in the Early and Late Bronze and Iron Age deposits (Table 3). Pigs eclipse caprines in abundance in the assemblage in the Byzantine period.

Pigs are present in relatively low frequencies at high status and urban sites in central Anatolia in the Bronze and Iron Ages, as seen at Boğazköy (LBA=2.4%; Iron=5.5%), Gordion (LB=8%; Early Iron=4.6%), MBA Acemhöyük (11%) and a small sample from levels I and II (MBA) of the Karum at Kültepe (13%, N=123), whereas they are markedly more abundant at the rural sites such as Kaman kale-höyük (MBA=21.7%; LBA=26.1-16.4%; Iron=21-11%) and Yarıkkaya (EBA= 33%) (Arbuckle 2006; Boessneck and Wiedemann 1977; Hongo 1996; Nicola nd; von den Driesch and Pöllath 2003; Zeder and Arter 1994). This fits with the general interpretation of pigs primarily as a rural, low status food resource produced by private households for household consumption. The abundance of pigs at Çadır is intermediate when compared to other middle and late Holocene sites in Anatolia suggestive of Çadır's proposed 'intermediate' status as a prosperous rural settlement possibly with special cultic significance in the LC through Late Bronze Age.

Biometrics

LSI values for fused and unfused pig specimens are presented in Figure 13 for LC, LB, Iron and Byzantine levels at Çadır as well as Neolithic Köşk. Median values for fused specimens change relatively little through the stratigraphic sequence and a one-way ANOVA test was unable to identify significant differences in the size of fused specimens through time.

With the exception of the Iron Age, which is characterized by the presence of very small fused specimens (all representing early fusing skeletal parts including scapula, proximal radius), the size range of fused specimens from Çadır changes very little over time. One specimen, a lower third molar, from the LC deposits (trench 770.890, locus 62) is in the size range of female wild boar from Neolithic Köşk Höyük and likely represents a hunted individual but all other specimens likely represent domesticates.

Since pigs produce large litters and are often slaughtered at younger ages than other domesticates, age of slaughter has a greater impact on LSI values for pigs than for other taxa. Unfused specimens show an extreme range in size from very small to adult-sized reflecting the practice of culling swine from virtually just after birth through their second and third years. Although perhaps related to small sample size, the slaughter of the youngest and therefore smallest sized piglets is not represented in the biometric data in the LC and LB levels and the few measurable unfused specimens are comparable in size to small adults. This lack of evidence for culling very young piglets is curious, as this is a typical feature of pig exploitation, and may reflect a specific preference of the residents of the south side of the mound (from where the samples derive) for the flesh of older and larger pigs.

In contrast, in the Iron Age and Byzantine periods unfused specimens include both extremely small individuals (LSI < -0.20) as well as those in the size range of older fused specimens. This suggests that immature pigs were slaughtered both as very young piglets as well as older juveniles once adult body size was reached.

Demographics

The same patterns evident in the biometrics also show up in the kill-off data (Figs 14, 15; Tables 8, 9). Although most pigs were culled within the first year in all periods, fewer swine were slaughtered at the youngest ages in the LC levels. This is evident in the absence or low frequency of newborn and six month old animals in the tooth wear data (Fig. 14) as well as the elevated survivorship (80%) within the first year evident in the long bone fusion data compared to much lower survivorship in later periods (40-54%) (Fig. 15). In the Iron Age and Byzantine periods, the emphasis of pig management was on culling a large portion of new litters within the first 2 months followed by another peak in culling at around 18 months targeting older juveniles. This pattern is typical of rural systems of pig management in Anatolia as seen in the Middle Bronze and Iron Age levels and Kaman kale-höyük and EBA and MBA Tilbesar (Berton and Mashkour 2008; Hongo 1998).

Skeletal parts

Skeletal part frequencies for pigs are presented for LC, Iron Age and Byzantine levels at Çadır in Figure 16. As with other taxa, the overall pattern reflects variations in average bone density with the dense elements of the head and forelimbs over-represented while the less dense axial skeleton is generally under-represented. Exceptions to this pattern include an over-representation of axial elements in the Byzantine period, likely as a result of a lower exposure to taphonomic processes (see Table 4), as well as the extreme under-representation of foot elements in all periods.

Overall, deviations from expected frequencies are much greater for pigs than for other domesticates in the Çadır assemblage. Because of the status of pigs as unclean animals as documented in Hittite texts (Collins 2006), an attitude that may well have extended back into the LC, it is possible that pig remains were treated differently than butchery waste from other domesticates and waste parts such as feet may have been subject to different rules regarding proper disposal. This may at least partially explain the more volatile patterns seen in the representation of portions of the pig skeleton at Çadır. However, the over-representation of pig heads in the assemblage suggests either than cranial remains were somehow exempt from these rules or, alternately, that differential resistance to taphonomic processes is the main factor responsible for this pattern.

Equids (*Equus caballus*, *E. ferus*(?), *E. asinus*)

Although equid remains are fairly abundant at Çadır Höyük, representing 3% of the total assemblage (NISP=71) and ranging from 14% of the small LC/EBA assemblage to <1% of the Byzantine assemblage (Table 3), they are often difficult to identify to the species level. Part of this difficulty lies in the fact that three species of wild equid were endemic to Anatolia in the early and middle Holocene (including horses [*E. ferus]*, hemiones [*E. hemionus]*, and the extinct hydruntine [*E. hydruntinus]*) while domestic horses (*E. caballus*) and asses (*E. asinus*) are present from the third and perhaps fourth millennium BC (Bökönyi 1991; Clutton-Brock 1992; Grigson 1993; Uerpmann 1987; Vila 2006).

Once thought to have been absent from Anatolia in the Holocene (e.g., Bökönyi 1991) recent research has found abundant evidence for wild horses (*E. ferus*) across the central plateau from the Neolithic through the 4th and perhaps 3rd millennia BC from the Eskişehir region in the NW to the Altınova plain in eastern Turkey (Boessneck and von den Driesch 1976; Gülçur 1999; Martin and Russell 2006; Hans-Peter Uerpmann 2001; Vigne, et al. 1999; von den Driesch and Boessneck 1987).

It is generally held that horses were domesticated somewhere on the western Eurasian steppe and diffused south into Anatolia and the Near East in the third millennium BC where they are commonly encountered in faunal assemblages throughout the Bronze Age (Anthony 1991; Clutton-Brock 1992; Outram, et al. 2009; Vila 2006; Zeder 1986). However, the presence of wild horses in Anatolia through much of the Holocene, the relatively late dates for the earliest clearly domestic horses on the Eurasia steppe (mid to late fourth millennium BC (Outram, et al. 2009)), and the subsequent possibility that Anatolia may have been an independent center of horse domestication itself (Vila 2006:119) makes documenting the appearance of domestic horses in the region problematic.

A small number of remains representing relatively large-bodied horses from LC sites (4th and early 3rd millennia BC) in Anatolia have been identified in eastern Turkey at Norşuntepe (which may date as early as the 5th millennium BC (Benecke 2006:98)), Değirmentepe, Tülintepe, Tepecik, and Arslantepe. These remains have generally been interpreted as representing wild populations (Boessneck and von den Driesch 1976), although Bökönyi (1991) argues that this material represents the earliest domesticates in the region, based to no small extent on the assumption that wild horses disappeared from Anatolia in the Pleistocene—an assumption which has proved false (Vila 2006). However the identification of horses at fourth millennium sites in the Negev strongly suggests, on biogeographic grounds, that domesticates had diffused south by that time (Grigson 1993; Clutton-Brock 1992:56). Thus, fourth millennium horse remains in Anatolia pose a series of problems since they could plausibly represent either local wild or early domestic populations, and if domestic could represent either local domesticates or imports from the steppe via the Caucuses.

Hemiones, the dominant equid in Neolithic sites in southeastern Anatolia and north Syria (Bökönyi 1986; Meadow 1986; Uerpmann 1986; Vila 2006) have been identified in very small numbers on the southern plateau at Çatalhöyük and Pınarbaşı and apparently persisted into the Bronze Age at Demircihüyük (Carruthers 2003, 2004, 2005; Martin and Russell 2006; von den Driesch and Boessneck 1987). It should be noted that the fragmentary remains of hemiones are often very difficult to distinguish from those of their close relatives the hydruntines as well as domestic donkeys (Vila 2006), and as a result, the distribution of hemiones in Anatolia outside of the southeast is poorly understood.

The gracile hydruntine, endemic across Europe from the Iberian peninsula to Crimea in the Pleistocene, has been identified in the Eskişehir region of NW Anatolia (at Orman Fidanlığı and Kes Kaya), on the southern central plateau at Can Hasan III, Çatalhöyük, Pınarbaşı A/B, Köşk Höyük, and is likely also present at Tepecik-Çiftlik, and Güvercinkayasi from the Neolithic through the Middle Chalcolithic (5th millennium BC)

when it seems to have become extinct (Arbuckle 2006; Carruthers 2003, 2004; Martin and Russell 2006; Orlando, et al. 2006; Payne 1991; H.-P. Uerpmann 2001; Vigne, et al. 1999). Although also present in the Levant in the Pleistocene and in Iran through much of the Holocene (Helmer 1991; Orlando, et al. 2006), the distribution of hydruntines in Anatolia seems to have been limited to the western and southern plateau.

Wild asses are not endemic to Anatolia in the Holocene but are thought to have diffused as domesticates via Egypt and the Levant starting in the fourth millennium BC (Clutton-Brock 1992; Rossel, et al. 2008; Vila 2006). Domestic donkeys become widespread in the Early and Middle Bronze Age with Assyrian Colony period and Hittite texts indicating that this animal was well known in central Anatolia as a pack animal in the late third and second millennia BC (Collins 2002; Postgate 1986; Veenhof 1972).

As a result of the importance of the fourth millennium as the key period for the diffusion of domestic equids across the Near East, the equid remains from Çadır, particularly those from the LC contexts, play an important role in documenting the early appearance of these two important domesticates in Anatolia.

Identification

Identification of equid remains to species focused on morphological features of postcrania and cheek teeth (following Baxter 1998; Eisenmann 1986; Helmer 2000; Martin and Russell 2006; Meadow 1986; Payne 1991; Uerpmann 1991; Zeder 1986) as well as analysis of the biometrics of metapodials and first phalanges (after Dive and Eisenmann 1991; Eisenmann and Beckouche 1986). However, most remains were identified simply as large/robust or small/gracile equid with the former category representing horses (potentially either wild or domestic) while domestic donkey, hemiones, and hydruntines could potentially be represented in the latter category.

Both horse and donkey have been tentatively identified from among the equid skeletal and dental remains at Çadır beginning in the LC levels. Most of the equid remains come from the Iron Age deposits where many were found redeposited in fill and associated with mudbrick rubble. These deposits may represent the treatment of dead equids by dumping their bodies in unoccupied areas of the settlement as is common in rural areas of the Middle East today.

Cutmarks were identified on five equid specimens from Iron Age and LC/EB contexts (7% of specimens). Cutmarks on carpals, tarsals, and the distal aspect of the radius indicate that horses were occasionally dismembered and their flesh may have been consumed, although carcass processing was more likely related to the removal of hides.

Dental remains

Identifications of mandibular and maxillary cheek teeth are presented in Table 10. Identification was based on a combination of tooth size and the characteristic shape of the enamel folds, particularly the shapes of the lingual and buccal sulci (folds) for mandibular cheek teeth and the length and shape of the protcone, strength of caballine fold, and fossette shape for maxillary cheek teeth (Baxter 1998; Eisenmann 1986; Martin and Russell 2006; Payne 1991; Uerpmann 1991). Since the patterns of enamel folds used to

identify equid species change with the degree of tooth wear (Payne 1991) and since variation in these patterns between species is still poorly understood, identifications based on teeth are considered preliminary.

Both horses and donkeys were identified among tooth specimens. Two specimens from LC deposits were identified as probable horses while a third very small specimen is clearly not a horse and likely represents an early domestic donkey (although hemione or hydruntine are also possibilities). The majority of specimens derive from Iron Age contexts and include both horses and donkeys.

Biometrics

Analysis of the biometrics of equid postcranial remains includes the detailed analysis of metapodials and first phalanx (following Dive and Eisenmann 1991; Eisenmann and Beckouche 1986), but also incorporates the LSI method to characterize the overall size of specimens compared to a standard animal, in this case a modern domestic donkey.

Based on Eisenmann's extensive comparative studies, measurements of the metapodials and first phalanges provide useful evidence for species level identification of equid remains. Following this method, Çadır specimens were compared with standard animals representing horses, hemiones, asses, and hydruntines (Figs 17-20). The four measureable metacarpal III specimens presented in Figure 17 all represent horses and are intermediate between the stocky, wild Przewalski horses and large domestic draft horses. It is significant that specimen CD99 derives from LC deposits (locus 55, trench 770.890) confirming the presence of horse at Çadır in the late fourth millennium BC. Specimen CD1373 indicates the presence of large-sized horses at Çadır in the Iron Age.

Three measurable metatarsal III specimens deriving from Iron Age deposits are presented in Figure 18. Two of these represent small horses while the third (CD1534) most closely matches the expected value for donkey, although this is based on only one measurement.

Biometric analysis of four first phalanx specimens suggests that they all represent horse (Figs 19 and 20). Specimen CD2015 comes from LC deposits (LC Phase Ib; locus 62, trench 770.900), confirming the presence of horse in the first half of the fourth millennium BC at Çadır. The measurements for specimen CD1495 are somewhat smaller than the horse standard, but it is likely that this specimen, dating to the Iron Age, represents a small horse rather than a very large donkey, although it is also possible that hybrid mules or hinny could be present as well.

LSI values, presented in Figure 21, indicate that most specimens are larger than the standard, a modern donkey, and represent both large and smaller bodied horses. Only two fused specimens are equal to or smaller than the standard and therefore likely represent donkeys (although hydruntines and hemiones are also possibilities). Specimen CD1534 derives from Iron Age contexts and was identified as a likely donkey in the Figure 18 (MTIII measurements). This identification is supported by the LSI value, which is identical to that of the standard. Specimen CD1293 was recovered from the LC deposits (locus 55, trench 770.890) indicating that a small equid, probably a donkey, was present

by the second half of the fourth millennium cal BC in north central Anatolia. In addition, four more specimens are only slightly larger than the standard.

LSI values for LC and later periods equids at Çadır are summarized in Figure 22 and compared with values for other early equid populations in Anatolia and the Near East. There are no changes in the size range of equids through the stratigraphic sequence at Çadır, and most remains represent horses rather than donkeys or the other small equids. Çadır horses are comparable in size to fourth millennium horses from the Negev, representing on biogeographic grounds some of the earliest domestic horses in the Near East, and are considerably smaller than the large, wild(?) horses from LC sites in eastern Anatolia. However, the Çadır LC and later period equids are almost identical in size to the Neolithic and Chalcolithic wild horses at Köşk Höyük and Orman Fidanlığı making it very difficult to conclude whether the Çadır remains represent domestic or wild horses.

Although the wild or domestic status of the LC Çadır equids is difficult to ascertain with any degree of certainty, it seems likely that they represent early domesticates. Unlike the situation at Norşuntepe where large-bodied horses appear in the LC and then disappear in the succeeding EBA levels (Boessneck and von den Driesch 1976), horses are consistently represented in all levels at Çadır. In addition, although wild taxa are relatively well-represented in the LC deposits at Çadır they almost exclusively represent small mammals and there is very little evidence for the exploitation of large wild mammals at the site. Moreover, the horse remains at Çadır, including those from the LC levels, generally exhibit high frequencies of pathologies among foot bones (20%, N=30), suggesting they were used for traction and/or riding. Finally, the fact that there are no changes in the overall biometric characteristics of the Çadır equids from the LC through the Iron Age suggests a degree of continuity in the equid population that would not be expected if domesticates appeared only in the third or second millennium BC.

If the LC horses at Çadır are domesticates they may represent early imports from the Eurasian steppe via the Caucasus supporting other archaeological evidence for participation within a Transcaucasian interaction sphere (Steadman, et al. 2007). However, since local wild populations were present on the central plateau through much of the Holocene, it is also possible that the LC horses at Çadır resulted from a local (and potentially independent) process of domestication centered south of the Black Sea.

Thus, in summary of the first analysis of the equid remains at Çadır, we can confirm the presence of horses (probably early domesticates) in the early and late fourth millennium BC and further suggest that a small equid, probably the domestic donkey, was present by the late fourth millennium as well.

Other taxa

A wide range of wild taxa are represented at Çadır, primarily in the LC levels. Deer are present in small numbers in the LC and Iron Age deposits and include roe deer (*Capreolus capreolus*), fallow deer (*Dama sp.*), as well as red deer (*Cervus elaphus*) (Table 2). With the exception of a fragment of an ilium from an Iron Age context,

postcranial remains are found only in the LC deposits while antler was used in tool manufacture through the Iron Age.

The remains of hare (*Lepus capensis*) are very common in the LC deposits representing 7.8% of the assemblage (N=54) but are represented by only seven additional specimens in subsequent periods. All parts of the skeleton are represented and concentrations of hare remains are found in several pits located in trench 770.900 (L62, n=14 and L66, N=11) possibly indicating localized consumption or processing of hares. In addition, the unusual find of a complete set of articulated carpals and metacarpals, representing a left wrist and manus, recovered from the remains of a roofed courtyard in the Burnt House (L94 in trench 770.900) suggests that "rabbits' feet" may have been curated for some purpose (perhaps for luck) in the LC. Finally, the only faunal sample so far examined from the Middle Chalcolithic contexts exposed in the Deep Sounding (L60 in trench 770.900), which currently represent the earliest dated deposits at the site (c. 5200-4500 cal BC), consists of three hare bones indicating that the use of hare has a long history at the site.

Carnivores

Carnivores are represented in small numbers by the remains of fox (*Vulpes*), dog/wolf (*Canis sp.*), small mustelids (*Mustela sp.*, representing either weasel or polecat or possibly a martin [*Martes*]), cat (*Felis sp.*), and badger (*Meles*) (Table 2). As with other wild taxa, the remains of carnivores are overwhelmingly concentrated in the LC deposits. The carnivores represented at Çadır reflect a combination of commensal and domestic animals, some of which may have been used for pelts, particularly in the LC levels.

Testudo

Tortoise (*Testudo graeca*) remains have previously been noted to occur in large quantities at Çadır (Steadman et al. 2007), and represent a full 12% of the total recorded assemblage to date based on NISP (n=293) (Table 2). However, 88% of these specimens (N=259) represent disarticulated carapace and plastron fragments while only 12% (N=34) represent the remains of the appendicular skeleton indicating that tortoise was probably rarely consumed at the site. Moreover, no specimens show signs of being processing in the form of impact fractures or cutmarks, nor do any exhibit evidence for burning.

Tortoise remains are present in all levels with the exception of the Byzantine period but are particularly concentrated in Iron Age deposits where 162 specimens were found concentrated in loci 42-43 in trench 790.890. These concentrations of tortoise remains pose a problem for interpretation. Tortoises may burrow into disturbed sediments during winter hibernation (Cogger and Zweifel 1998) and it possible that at least some of the specimens recovered at Çadır are intrusive. Some of the remains clearly exhibit differences in color and 'freshness' from the rest of the faunal assemblage indicating they are not ancient in origin, but many specimens appear to be ancient (although perhaps ancient intrusives). In the absence of evidence for processing or clear use by humans the degree to which tortoises or their carapaces were actually used by the inhabitants of Çadır in any period is currently unclear. Their abundance should not be interpreted as

representing "a strong dependence on riverine resources" (Steadman et al. 2007:392), as evidence for use of such resources is extremely scarce at Çadır.

DISCUSSION

The faunal evidence from Çadır suggests that the animal economy changed significantly over time as inhabitants adapted to changing social, political and environmental circumstances on the northern fringe of the central Anatolian plateau through the middle and late Holocene.

In the LC period the animal economy at Çadır is reflective of a bustling and prosperous regional center. Animal husbandry emphasized sheep and goats with management focused on the intensive and production of wool and hair, likely for external markets. Texts from the Assyrian Colony period indicate the presence of a developed wool and textile trade within Anatolia (Larsen 1967; Veenhoff 1972; 1995) and it is likely that precursors to this Bronze Age system were in place in the fourth millennium BC as well.

A focus of the cattle management systems was on the production of large adult males, indicating a sizable investment in fodder and labor to raise these animals to adulthood. This emphasis on adult male cattle suggests that the inhabitants of Çadır either preferred consuming large males, or that these individuals were raised specifically for traction, although there is no evidence for a high frequency of foot pathologies in the LC suggestive of the use of cattle for regular and heavy labor. Swine husbandry was a tertiary subsistence strategy at LC Çadır. The lack of evidence for culling very young piglets along with the low frequency of pig remains in the LC assemblage suggests that pig husbandry was not intensive and that pigs functioned as a supplemental, low investment, and ad hoc meat resource for Çadır households. Finally, it is tentatively suggested that both domestic horses and donkeys were present at LC Çadır. Representing some of the earliest domestic equids in Anatolia, horses and donkeys at Çadır were probably limited to community elites and may have been used for riding, traction and for their hides. That LC Çadırans had access to these new, rare, and presumably expensive domesticates further underscores the prosperity of this emergent regional center in the fourth millennium BC.

Overall, the focus of the animal economy on the intensive production of commodities such as wool and hair as well as management strategies focused on supporting large numbers of expensive-to-raise adult male ungulates suggests that Çadır's economy was both prosperous and intertwined within a complex and regionally integrated economic system. This system could perhaps be described as one of *conspicuous production*, reflecting the fact that the animal economy at this small emergent center was focused as much on generating wealth and status as satisfying local subsistence needs. Moreover, the presence of early evidence for the involvement of metal tools in carcass processing at Çadır indicates both the wealth of the inhabitants as well as access to regional trade networks (Adcock and Arbuckle 2009). Although evidence for a high level of regional economic integration is surprising for the northern plateau, it supports recent interpretations of the LC settlement at Çadır as a wealthy local center situated within an

increasingly complex and regionally integrated sociopolitical environment (Steadman et al. 2007).

Although the LC economy at Çadır was based on domesticates with wild animal resources contributing insignificantly to the diet (comprising only 6% of the assemblage based on bone weight), wild animals did play a unique role at LC Çadır (they comprise c.25% of the assemblage). Wild boar and deer were occasionally hunted, while fox, hare, weasel and badger may have been consumed and/or used for furs. The presence of a "rabbit's foot" suggests that hare may have also played a role in ritual practices at LC Çadır. The unique abundance of wild animals may suggest that LC Çadırans regularly exploited a wider range of environmental zones around the settlement compared to later periods, or, alternately, that the LC cultural system was characterized by specific cultural practices involving wild animals (e.g., use of rabbits' feet and fox, weasel and badger pelts, etc.) that fell out of practice in later periods.

Only a very small faunal sample is currently available representing the LC/EB transitional period, making interpretation of the animal economy difficult. Changes in faunal spectrum suggest that the LC system focused on caprines was no longer in place with an increasing emphasis on cattle and pigs at the expense of sheep and goats. This more balanced subsistence system with a greater emphasis on cattle, perhaps characteristic of increasingly intensive agricultural production, characterizes the LB and Iron Age settlements as well.

Although based on a limited sample, the decline in wild taxa evident in the Transitional period suggests changes in the cultural practices previously associated with small wild mammals and/or reduced use of distant woodland and riverine ecozones. This decline in the use of wild animals is characteristic of later periods at Çadır as well, further highlighting the uniqueness of the LC system.

With the exception of a significant increase in the importance of cattle, fauna evidence suggests general continuity between the animal economies of the LC and LB occupations at Çadır. Biometric data suggest that, like the LC system, the LB economy at Çadır was focused on the production of expensive-to-maintain adult ungulates, although due to small sample sizes it is unclear if fiber continued to be a major focus of caprine production. Cattle reach their peak in the LB levels (25%) further suggesting Çadır was a wealthy rural center able to devote considerable resources to the production of adult, male caprines and cattle. The frequency of pigs at LB Çadır is relatively high (14%) when compared to contemporary urban and political centers on the Anatolian plateau such as Boğazköy–Büyükkaya (2.4%), Gordion (8%), and Kuşaklı (4%) or to NE Anatolian sites such as Sos (<1%), but lower than rural settlements such as Kaman–Kalehöyük (26.1-16.4%) and EBA Yarıkkaya (33%) (Boessneck and Wiedemann 1977; Hongo 1998; Howell-Meurs 2001; von den Driesch and Boessneck 1981; von den Driesch and Vagedes 1997; Zeder and Arter 1994). This is perhaps suggestive of Çadır's intermediate status as a rural but wealthy settlement that may have played an important role in Hittite religious affairs. As in the LC, swine husbandry was characterized by small-scale and nonintensive production representing a tertiary source of meat and fat.

Overall, the LB animal economy at Çadır gives the impression of a prosperous rural center in the Hittite heartland that was rural enough to avoid evidence for strong centralized economic control (i.e., no evidence for a specialized provisioning system; relatively high frequency of pigs) but wealthy enough to be connected to supra-local, and perhaps regional, commodities markets. Although it is possible that the source of this wealth was related to the site's special status as a cult center (Gorny 2005, 2006a), there is currently no clear indication from the faunal remains to suggest that Çadır functioned as a major cult center frequented by Hittite kings.

A major shift is evident in the fauna remains at the transition from the Late Bronze to the Iron Age at Çadır. In terms of species frequencies, cattle decline somewhat in importance and caprines and pigs increase in relative abundance. These changes are relatively minor, however, and it is in husbandry practices and the goals of herd management that the real changes are to be found in the Iron Age. For caprines, the previous management system focused on the 'expensive' production of adult males for fiber is replaced by one focused on adult females suggestive of a strategy focused on the production of milk and meat while maximizing herd reproductive security (Redding 1981b). Moreover, an increase in the ratio of goats relative to sheep suggests an increased emphasis on risk reduction and household level production of milk and hair and a decreased emphasis on the potentially more valuable but risky production of sheep.

Similarly, the previous system of cattle management focused on the production of adult males is now replaced by one in which adult females dominate. These cows were likely used for milk as well as meat while the high frequency of foot pathologies suggests that they were also used for traction. Elsewhere, the use of cows for draught purposes has been associated with small-scale, "garden agriculture" (Bogaard 2005), while oxen are more characteristic of large-scale, surplus producing agricultural systems (Isaakidou 2008), suggesting a contraction in the scale of agricultural production at Iron Age Çadır. In addition, the system of pig husbandry undergoes major reorganization in the Iron Age. For the first time, very young piglets are regularly culled, suggesting an increase in the intensity of management and continued concern with the efficient use of limited foddering resources. Finally, the appearance of small-sized sheep, goats, and cattle suggest the possible appearance of new animal populations, which in turn suggests that new human populations may have arrived at the site in the early first millennium as well.

Some of these changes likely have to do with the nature of the contexts sampled in the Iron Age deposits, which include more secondary trash deposits in work areas surrounding the south entrance to the settlement. But beyond these contextual differences there seem to be fundamental changes in the animal economy in the early first millennium BC at Çadır. The earlier prosperous system of 'conspicuous production' is gone, replaced by one focused on maximizing herd reproduction, minimizing risk, and emphasizing the production of resources such as milk and meat for local consumption rather than commodities such as wool for regional markets. The replacement of LC and LB practices of raising male cattle (perhaps including oxen) for traction with a draught-cow system characteristic of small-scale cultivation further suggests that this decline in the scale of

production affected the entire agricultural system and was not limited to the animal economy alone.

Unlike the situation at other sites on the Anatolian plateau where there is little evidence for changes in the animal economy at the LB/early Iron transition, the collapse of the LB world system seems to have had a major impact on the organization of the animal economy at Çadır. These changes seem to be reflective of a process of ruralization as Çadır lost its position as a favored economic or cultic center, lost access to regional markets, and re-oriented the agro-pastoral system for local scale production.

The Byzantine assemblage shows that a dramatically different system of animal management was in place on the northern plateau in the Late Holocene. The Byzantine animal economy was overwhelmingly focused on cattle (60% of the assemblage), secondarily on pigs, while caprines declined to tertiary resource. This focus on cattle, very similar to what Strabo describes for the Roman province of Cappadocia (Gwatkin 1930), is suggestive of an intensive agricultural economy and may have come to characterize the village economy of the central plateau by the Hellenistic period. It has also been documented, although slightly later, at the 13th century settlement Korucutepe in eastern Anatolia (Boessneck and von den Driesch 1974). Systems of pig management in the Byzantine settlement were very similar to those of the Iron Age indicating a continued intensive use of this meat resource by Byzantine households, while small-scale caprine management focused on a range of products including milk, meat, and wool for local consumption.

CONCLUSIONS

This paper has outlined the main features of the organization of the animal economy and its change over time through the middle and late Holocene at Çadır Höyük, focusing on the LC, LB, Iron Age and Byzantine periods. It is important to emphasize that the animal economies which supported the complex cultures of these periods are virtually unknown on the northern Anatolian plateau. The patterns described here including the notion of conspicuous production in the LC and LB settlements, the dramatic changes in animal management in the Iron Age, the cattle based agricultural economy of the Byzantine period, and the potentially early appearance of early domestic horses and donkeys in the fourth millennium BC therefore represent starting points for future discussions of economic organization on the plateau rather than final conclusions.

Faunal work at Çadır is still in its infancy, and, as a result, many questions remain for future seasons of research. In particular, the goals of future work will focus on describing the nature of the animal economies in the EBA and MBA periods at Çadır, developing a more detailed picture of the pace of the economic reorganization that occurred in the Early Iron Age, and also examining evidence for economic changes during the volatile last centuries of the Byzantine occupation before the Selcuk invasions of the 11th century AD. Continuing work at the site will provide new data to refine the initial interpretations presented here and will continue to provide valuable insights into

the organization and context of animal economies on the north central Anatolian plateau in the Middle and Late Holocene.

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Period	Level	Approximate calendar dates
Byzantine	IX	AD 400-1000
Roman	VIII	AD 1-300
Hellenistic	VII	200-1 BC
Achaemenid	VI	900-200 BC
Iron Age	V	1200-900 BC
Late Bronze	IV	1600-1200 BC
Middle Bronze	III	2000-1600 BC
Early Bronze	II	3100-2000 BC
Late Chalcolithic	Ia-c	4500-3100 BC
Middle Chalcolithic	Id-e	5300-4500 BC

Table 1. Summary of the phasing and chronology at Çadır.

Period	LC		LC/EB		LB		Iron		Byz		Total	
Taxa	NISP	%	NISP	%	NISP	%	NISP	%	NISP	%	NISP	%
Micro-mammal	17	2.5	0	0.0	0	0.0	5	0.5	0	0.0	22	0.9
Small mammal	13	1.9	0	0.0	0	0.0	3	0.3	0	0.0	16	0.7
Med mammal	26	3.7	6	9.4	7	4.6	21	2.1	2	0.4	62	2.6
Large mammal	28	4.0	1	1.6	5	3.3	22	2.2	121	23.1	177	7.3
Med ungulate	28	4.0	3	4.7	3	2.0	28	2.8	4	0.8	66	2.7
Large ungulate	22	3.2	2	3.1	2	1.3	20	2.0	35	6.7	81	3.3
Ovis/Capra	139	20.1	14	21.9	31	20.5	233	23.6	31	5.9	448	18.5
Ovis	47	6.8	7	10.9	9	6.0	44	4.5	11	2.1	118	4.9
Capra	39	5.6	2	3.1	8	5.3	58	5.9	7	1.3	114	4.7
Med bovid/cervid	27	3.9	1	1.6	3	2.0	15	1.5	4	0.8	50	2.1
Bos taurus	41	5.9	9	14.1	29	19.2	116	11.8	233	44.5	428	17.7
Bos indicus?	0	0.0	0	0.0	0	0.0	0	0.0	2	0.4	2	0.1
Capreolus	3	0.4	1	1.6	0	0.0	0	0.0	0	0.0	4	0.2
Dama	2	0.3	0	0.0	1	0.7	24	2.4	0	0.0	27	1.1
Cervus	2	0.3	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1
Sus	77	11.1	8	12.5	14	9.3	101	10.2	61	11.7	261	10.8
Small equid	3	0.4	0	0.0	1	0.7	7	0.7	0	0.0	11	0.5
Large equid	5	0.7	6	9.4	1	0.7	25	2.5	0	0.0	37	1.5
Equid	6	0.9	1	1.6	1	0.7	12	1.2	3	0.6	23	1.0
Small carnivore	4	0.6	0	0.0	0	0.0	0	0.0	0	0.0	4	0.2
Med carnivore	5	0.7	1	1.6	4	2.6	1	0.1	0	0.0	11	0.5
Felis	2	0.3	0	0.0	0	0.0	1	0.1	0	0.0	3	0.1
Mustela sp. or *Martes*	0	0.0	0	0.0	0	0.0	5	0.5	0	0.0	5	0.2
Meles	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
Canis	6	0.9	0	0.0	3	2.0	6	0.6	2	0.4	17	0.7
Vulpes	16	2.3	0	0.0	0	0.0	6	0.6	0	0.0	22	0.9
Erinaceus	3	0.4	0	0.0	0	0.0	0	0.0	1	0.2	4	0.2
Rodentia	0	0.0	0	0.0	0	0.0	11	1.1	0	0.0	11	0.4
Lepus	54	7.8	0	0.0	2	1.3	4	0.4	1	0.2	61	2.5
Reptilia	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0
Testudo	58	8.4	1	1.6	26	17.2	208	21.1	0	0.0	293	12.1
Snake	5	0.7	0	0.0	0	0.0	0	0.0	0	0.0	5	0.2
Amphibian	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
Pisces	1	0.1	1	1.6	0	0.0	0	0.0	0	0.0	2	0.1
Aves	12	1.7	0	0.0	1	0.7	10	1.0	5	1.0	28	1.2
Total	693	100.0	64	100.0	151	100.0	987	100.0	523	100.0	2418	100.0

Table 2. Quantification of identified fragments based on specimen count.

Taxa (DZ)	LC	LC/EB	LB	Iron	Byz
Sheep/goat	48.2	35.7	42.9	48.1	16.6
Cattle	12.0	23.8	25.0	18.4	60.2
Pig	10.7	16.7	13.4	14.6	18.7
Equids	1.9	14.3	1.8	6.0	0.6
Other	27.2	9.5	17.0	12.9	3.9
Total %	100.0	100.0	100.0	100.0	100.0
Total N (DZ)	475	42	112	651	337
ratio of caprines to cattle	4.0	1.5	1.7	2.6	0.3
ratio of caprines to pigs	4.5	2.1	3.2	3.3	0.9
ratio of sheep to goat	0.9	1.5	1.0	0.8	2.1

Table 3. Quantification of specimens identified to the genus level based on diagnostic zones (see text).

	LC	LC/EB	LB	Iron	Byz
completeness index (1-5)	2.38	2.26	2.46	2.23	3.09
	N=375	N=41	N=68	N=466	N=117
Mean frag length (mm): med mammal	46.8	51.3	51.2	54.7	53.7
	N=239	N=29	N=37	N=267	N=62
Mean frag weight (grams): med mammal	6.3	10.5	9.6	7.4	11.0
	N=388	N=41	N=76	N=524	N=120
Mean frag length (mm): large mammal	66.5	83.3	90.8	76.1	82.8
	N=73	N=14	N=13	N=115	N=313
Mean frag weight (grams): large mammal	27.4	43.0	39.3	36.8	44.4
	N=108	N=19	N=29	N=202	N=394
carnivore modification (%)	2.7	6.3	4.6	5.0	1.5
	N=698	N=64	N=151	N=988	N=523

Table 4. Indices of taphonomic destruction, fragmentation, and quantification of evidence for modification at Çadır (see text for explanation).

	Ovis/Capra				*Ovis*				*Capra*			
	LC		Iron		LC		Iron		LC		Iron	
	UF	F	UF	F	UF	F	UF	F	UF	F	UF	F
atlas	1	1	0	0	0	0	0	0	0	0	0	1
scapula	0	2	0	0	0	0	0	0	0	0	0	0
pxRadius	0	3	1	3	0	1	0	1	0	1	0	3
pelvis	1	1	1	9	0	2	1	0	0	0	0	1
dsHumerus	0	3	1	2	0	3	0	2	0	2	0	5
Phalanx 1	2	1	1	1	1	2	1	3	2	7	0	6
Phalanx 2	2	8	1	3	0	1	0	0	0	3	0	3
dsTibia	0	1	1	3	0	3	1	3	0	1	0	0
dsMetapodials	3	1	11	1	0	3	0	7	2	3	4	2
Calcaneum	0	0	0	0	1	1	0	1	1	0	1	2
pxFemur	1	0	1	0	0	0	1	1	0	1	1	0
dsRadius	1	1	2	0	1	2	1	0	1	1	0	0
pxHumerus	0	0	0	0	0	0	0	0	0	0	2	0
dsFemur	0	0	0	1	0	0	0	0	0	0	0	0
pxTibia	1	0	1	1	0	0	0	0	0	0	0	0
pxUlna	1	0	2	1	0	0	0	0	0	0	0	0

Table 5. State of fusion of the long bones for sheep, goats, and sheep/goat categories for LC and Iron Age levels. F=fused, UF=unfused; px=proximal, ds=distal.

	LC				Iron Age				Byzantine			
MWS	Sheep	Goat	O/C	Total	Sheep	Goat	O/C	Total	Sheep	Goat	O/C	Total
A	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0
C	2	0	1	3	2.5	2	3	7.5	2	0	0	2
D	0	0	0	0	1.5	0.33	1.2	3.03	1	0	0	1
E	0.5	0	3	3.5	0.2	0.33	2	2.53	0	0	1	1
F	0.5	0.5	1	2	1.7	0.83	3.25	5.78	0	0	0	0
G	0	0.5	4	4.5	0.7	2.8	3.67	7.17	1	0	1.5	2.5
H	1	0	3	4	0.7	2.3	3.67	6.67	0	0	0.5	0.5
I	0	0	1	1	0.7	0	0.67	1.37	0	0	0	0
Total	4	1	13	18	8	8.59	17.46	34.05	4	0	3	7

Table 6. Survivorship data based on eruption and wear of mandibular teeth for sheep and goats from LC and Iron Age levels (following Payne 1973). Values for Mandibular Wear Stages (MWS's) were calculated using proportional allocation for specimens assignable to multiple stages (see Payne 1973).

	LC			Iron			Byzantine		
	UF	F	%F	UF	F	%F	UF	F	%F
atlas	0	0		0	0		0	3	100.0
axis	0	0		0	0		0	2	100.0
scapula	0	0		0	1	100.0	0	5	100.0
pelvis	1	3	75.0	0	3	100.0	1	3	75.0
pxRadius	0	3	100.0	1	3	75.0	0	9	100.0
dsHumerus	0	0		0	3	100.0	1	5	83.3
Phalanx 1	1	5	83.3	1	8	88.9	1	12	92.3
Phalanx 2	0	3	100.0	2	4	66.7	0	14	100.0
dsTibia	0	0		0	4	100.0	4	2	33.3
dsMetapodials	0	4	100.0	1	9	90.0	4	7	63.6
Calcaneum	0	0		0	0		2	1	33.3
pxUlna	1	0	0.0	0	0		7	0	0.0
dsUlna	0	0		0	0		3	0	0.0
pxFemur	1	0	0.0	0	1	100.0	5	4	44.4
dsFemur	1	1	50.0	0	0		3	1	25.0
dsRadius	0	0		1	1	50.0	6	1	14.3
pxTibia	0	0		1	0	0.0	3	2	40.0
pxHumerus	0	0		0	0		2	1	33.3
Total	5	19	79.2	7	37	84.1	42	72	63.2

Table 7. State of fusion of the long bones for cattle for LC, Iron Age and Byzantine Çadır. F=fused, UF=unfused; px=proximal, ds=distal.

	Age stage	LC	Iron	Byzantine
newborn	I	0	5	3
<6	II	3	3	4
6	III	0.5	4	0
12	IV	1.5	1	0
18	V	1	4	6
24	VI	0	4	0
senile	VII	0	1	0
	Total	6	22	13

Table 8. Survivorship data based on eruption and wear of mandibular teeth for Çadır pigs (following Grant 1982). Age categories follow Hongo and Meadow (1998).

	LC			Iron Age			Byzantine		
	UF	F	%F	UF	F	%F	UF	F	%F
atlas	0	0	0.0	0	0	0.0	1	1	50.0
axis	0	0	0.0	0	0	0.0	0	0	0.0
scapula	2	0	0.0	1	0	0.0	1	1	50.0
pelvis	0	4	100.0	2	0	0.0	3	0	0.0
pxRadius	0	1	100.0	2	5	71.4	0	2	100.0
dsHumerus	0	3	100.0	2	0	0.0	0	1	100.0
Phalanx 2	0	1	100.0	2	1	33.3	0	1	100.0
Phalanx1	2	3	60.0	4	1	20.0	2	1	66.7
dsTibia	2	0	0.0	2	1	33.3	2	0	0.0
dsMetapodials	3	0	0.0	10	1	9.1	7	1	12.5
Calcaneum	0	0	0.0	0	0	0.0	1	0	0.0
dsFibula	1	0	0.0	0	0	0.0	0	0	0.0
pxUlna	0	0	0.0	0	0	0.0	1	0	0.0
dsUlna	0	0	0.0	0	0	0.0	1	0	0.0
pxFemur	0	0	0.0	0	0	0.0	0	0	0.0
dsFemur	0	0	0.0	1	0	0.0	0	0	0.0
dsRadius	0	0	0.0	2	0	0.0	3	0	0.0
pxTibia	2	0	0.0	3	1	25.0	1	0	0.0
pxHumerus	1	0	0.0	0	0	0.0	0	0	0.0
Total	13	12	48.0	31	10	24.4	23	8	25.8

Table 9. State of fusion of the long bones for pigs for LC, Iron Age and Byzantine Çadır. F=fused, UF=unfused; px=proximal, ds=distal.

ID #	Context	Context	Tooth	occlusal length (mm)	Taxa
CD1325	L6, 760.900	CHALC	M3/		small, not a horse
CD1925	L10, 770.880	CHALC	P/3 or P/4	30.6	Horse?
CD2189	L75, 770.890	CHALC	P2/	36.3	Horse?
CD829	LA, 800.930	LB?	P4/?	26.9	not a horse
CD851	F24, 800.930	LB?	P/2	29.8	?
CD1240	L40, 790.890	IRON	M1/?	23*	Donkey?
CD1381	L97, 790.890	IRON	P/2	34.7	Horse
CD1382	L97, 790.890	IRON	P/3	30.3	Horse
CD1383	L97, 790.890	IRON	M/1 or M/2	28.4	Horse
CD1384	L97, 790.890	IRON	P/4	30.2	Horse
CD1516	L109, 790.890	IRON	P/4	21.6	Donkey?
CD1755	F76, 790.890	IRON	P/2	28.1	Donkey?
CD1756	F76, 790.890	IRON	P/3	25.4	Donkey?
CD1757	F76, 790.890	IRON	P/4	25.6	Donkey?
CD1758	F76, 790.890	IRON	M/1	24.3	Donkey?
CD1759	F76, 790.890	IRON	M/2	22.7	Donkey?
CD2356	L68, 790.890	IRON	dp/3	31.5	Horse?
CD625	L12, 770.880	IRON	M/1 or M/2		?
CD853	L39, 850.880	IRON	P4/	23.6	Donkey?
CD854	L39, 850.880	IRON	M/1	20.1	Donkey?
CD855	L39, 850.880	IRON	M/2	20.6	Donkey?
CD960	L79, 790.890	IRON	P4/?	29.8	not horse?

Table 10. Summary of equid cheek teeth from Çadır Höyük, including context, occlusal length, and preliminary identification.

ID number	Context	Period	Element	species id
CD2015	L62, 770.900	LC	PX1 anterior?	small horse
CD99	L55, 770.890	LC	MC III	horse
CD1293	L55, 770.890	LC	PX3	donkey (?)
CD1778	L58, 770.900	LC/EB	PX1 posterior	large horse
CD1086	L106, 790.890	IRON?	MT III	small horse
CD2323	L66, 790.890	IRON	MC III	small horse
CD1534	L114, 790.890	IRON	MT III	donkey?
CD1373	L97, 790.890	IRON	distal MP	large horse
CD1425	L115, 790.890	IRON	distal MP	small horse
CD892	L97, 790.890	IRON	PX1 anterior?	large horse
CD1494	L60, 790.890	IRON	MT III	small horse
CD1495	L60, 790.890	IRON	PX1 posterior	horse

Table 11. Summary of Çadır equid postcranial remains including context, element and identification.

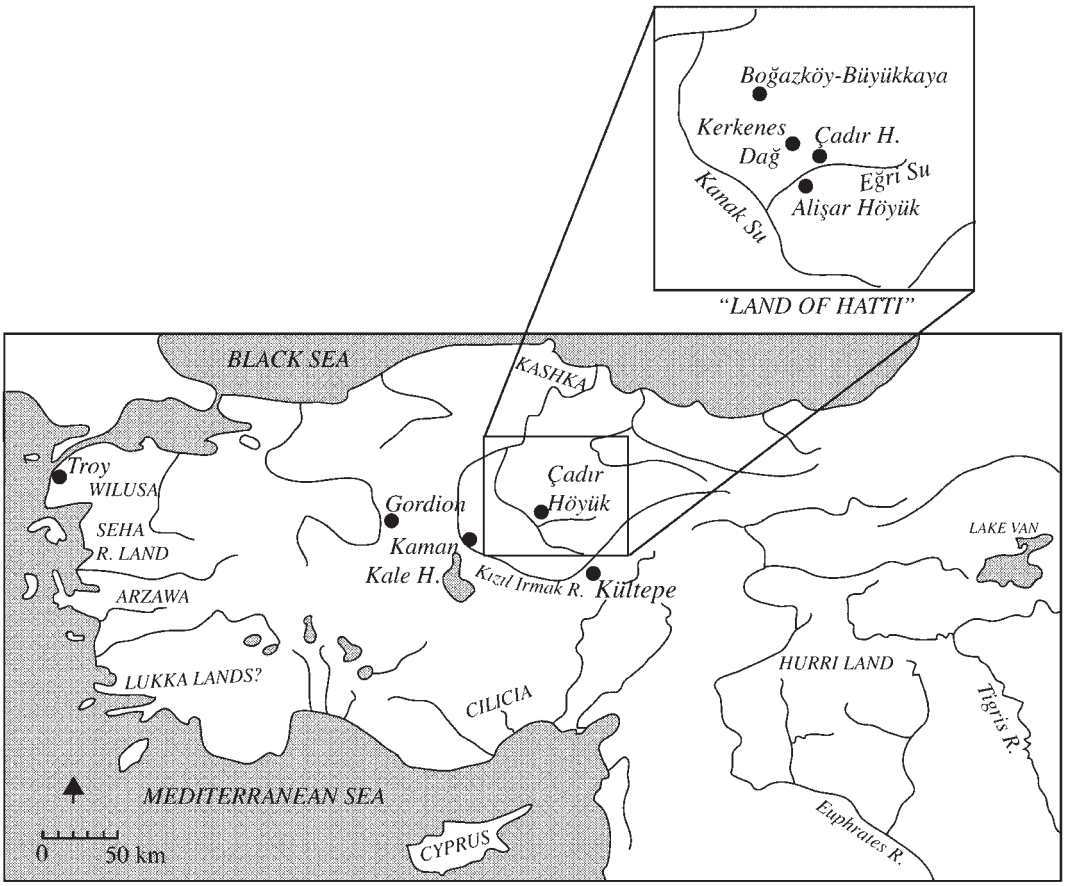

Figure 1. Map showing the location of Çadır Höyük.

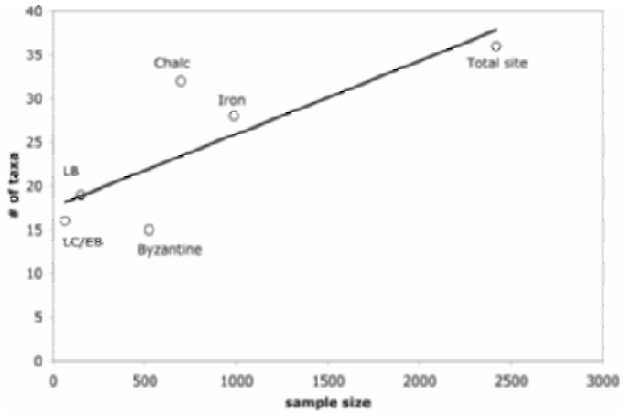

Figure 2. Graph showing the relationship between assemblage size and taxonomic diversity.

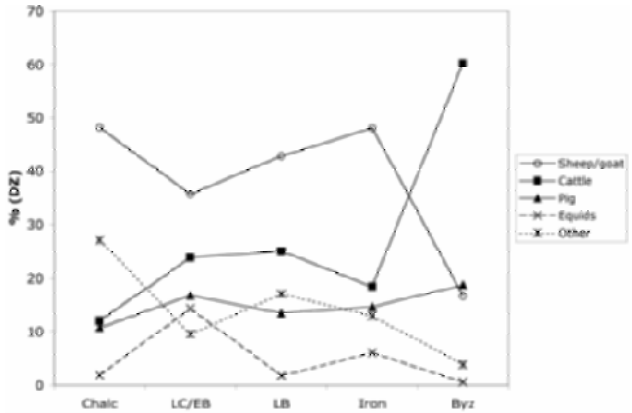

Figure 3. Graph showing the relative frequency of the primary species identified at Çadır.

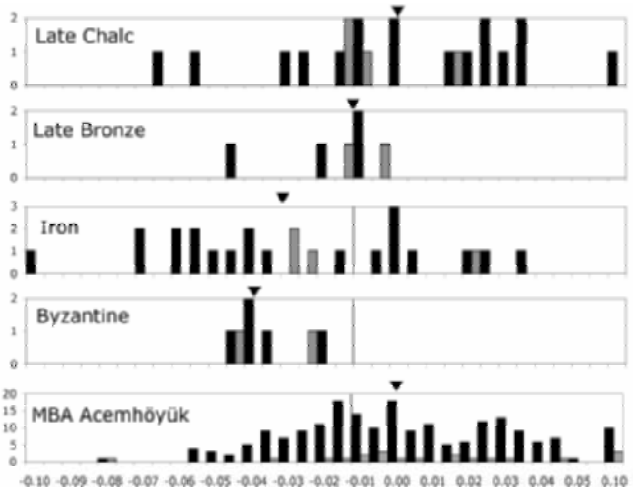

Figure 4. Log Size Index (LSI) values for fused (black) and unfused (gray) sheep specimens from LC, LB, Iron Age, and Byzantine levels at Çadır as well as MBA Acemhöyük. Black triangles indicate median LSI values.

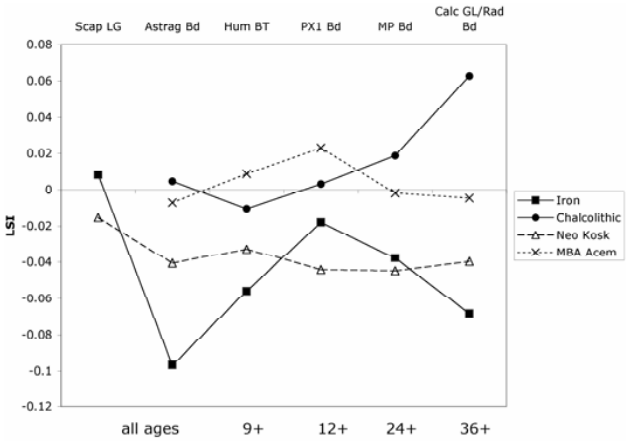

Figure 5. Mean LSI values for fused sheep specimens presented for skeletal parts that fuse at increasingly old ages (except for the astragalus which has no epiphyses). Lower X-axis indicates the age groups represented by measurements for each skeletal part. Scap LG=length of the glenoid of the scapula; Astrag Bd=distal breadth of the astragalus; Hum BT=breadth of the distal trochlea of the humerus; PX1 Bd=distal breadth of the first phalanx; MP Bd=distal breadth of metapodials; Calc GL=greatest length of the calcaneum; Rad Bd=distal breadth of the radius.

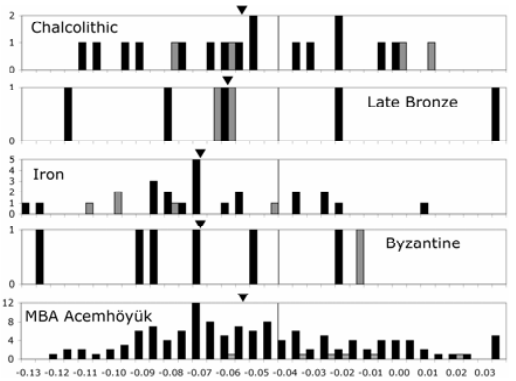

Figure 6. Log Size Index (LSI) values for fused (black) and unfused (gray) goat specimens from LC, LB, Iron Age, and Byzantine levels at Çadır as well as MBA Acemhöyük. Black triangles indicate median LSI values.

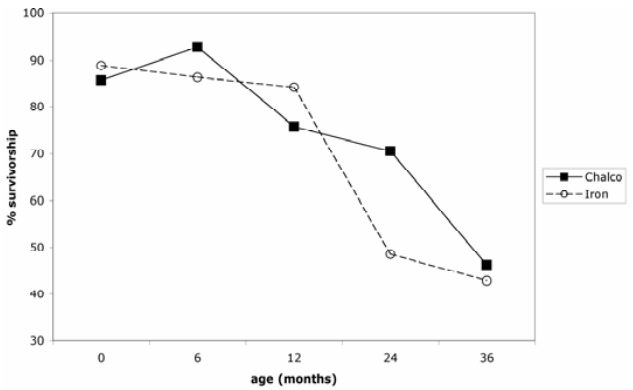

Figure 7. Survivorship curves for combined sheep and goats generated from long bone fusion for LC (n=80) and Iron Age (n=97) Çadır.

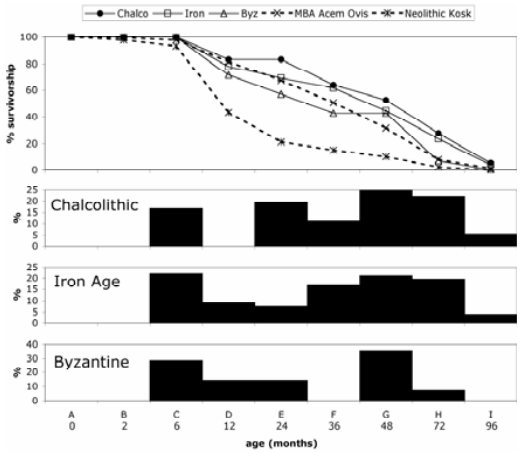

Figure 8. Survivorship curves and mortality frequencies for combined sheep and goats for Çadır and sheep from Neolithic Köşk and MBA Acemhöyük generated from tooth wear (after Payne 1973).

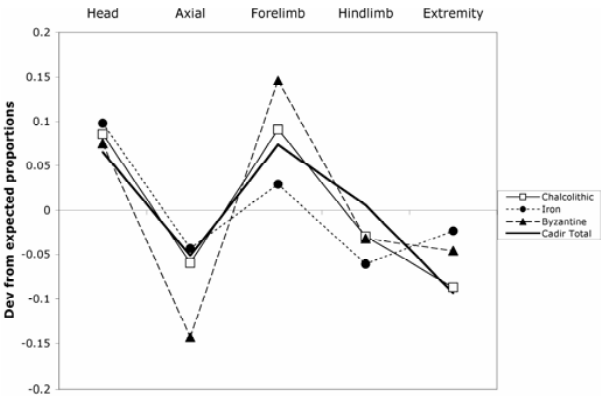

Figure 9. Representation of skeletal region for caprines compared to the expected values in a complete carcass. Positive values represent over-representation while negative values indicate a skeletal region is under-represented. Values are calculated using MAU(MNE) counts (see text for explanation) (LC MNE=157; Iron Age MNE=191; Byzantine MNE=45).

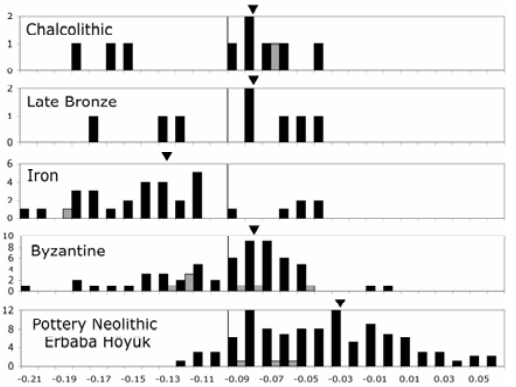

Figure 10. Log Size Index (LSI) values for fused (black) and unfused (gray) cattle specimens from LC, LB, Iron Age, and Byzantine levels at Çadır as well as Pottery Neolithic Köşk Höyük. Black triangles indicate median LSI values.

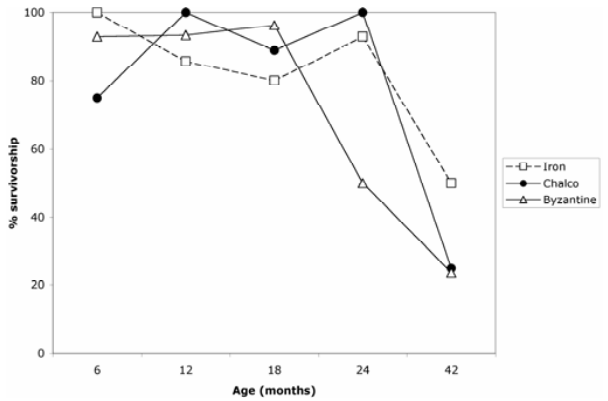

Figure 11. Survivorship curves for cattle generated from long bone fusion for LC (n=44), Iron Age (n=24), and Byzantine (n=114) Çadır.

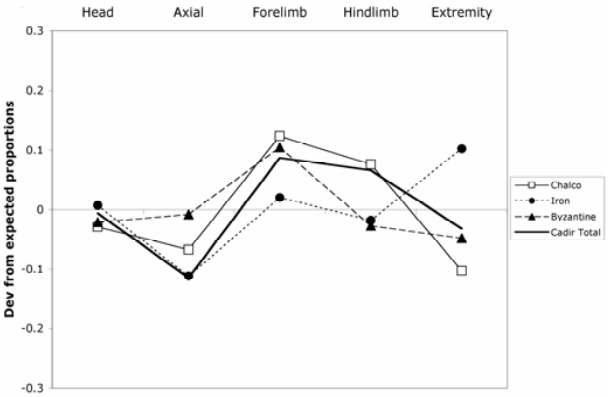

Figure 12. Representation of skeletal region for cattle compared to the expected values in a complete carcass. Positive values represent over-representation while negative values indicate a skeletal region is under-represented. Values are calculated using MAU(MNE) counts (see text for explanation) (LC MNE=54; Iron Age MNE=85; Byzantine MNE=137).

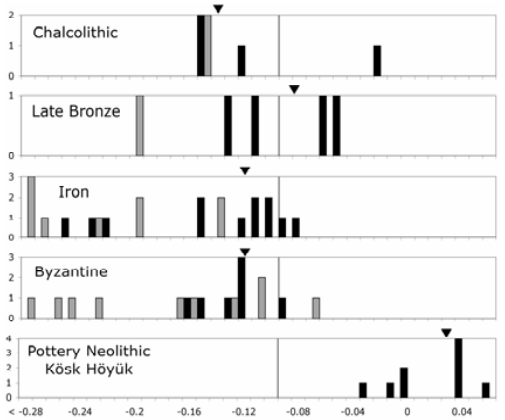

Figure 13. Log Size Index (LSI) values for fused (black) and unfused (gray) pigs specimens from LC, LB, Iron Age, and Byzantine levels at Çadır as well as Neolithic wild boar from Köşk Höyük. Black triangles indicate median LSI values for fused specimens.

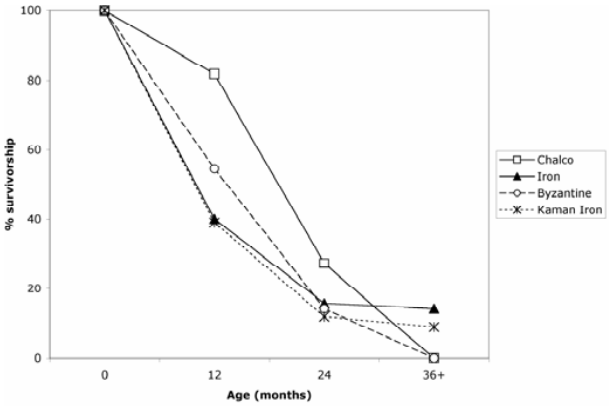

Figure 14. Survivorship curves and mortality frequencies for Çadır pigs based on tooth eruption and wear for LC (n=6), Iron Age (n=22) and Byzantine (n=13) levels (after Grant 1982). Age categories follow Hongo and Meadow (1998).

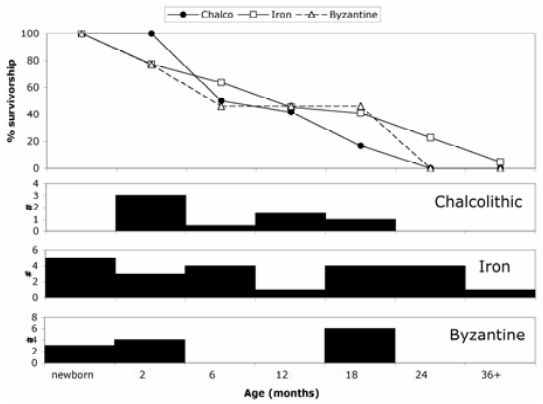

Figure 15. Survivorship curves for Çadır pigs generated from long bone fusion for LC (n=25), Iron Age (n=41), and Byzantine (n=31) levels. The curve for Iron Age Kaman kale-höyük is included for comparison (from Hongo and Meadow 1998).

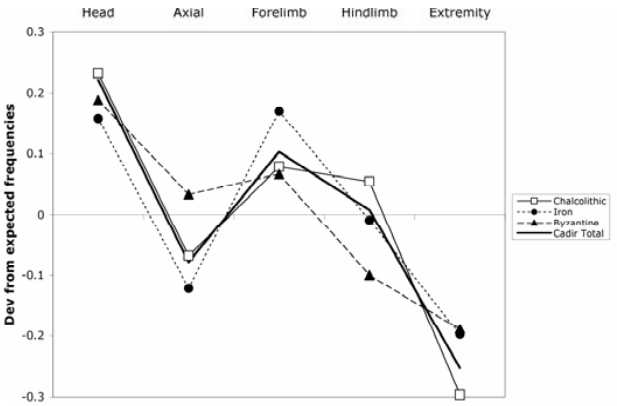

Figure 16. Representation of skeletal region for pigs compared to the expected values in a complete carcass. Values are calculated using MAU(MNE) counts (see text for explanation) (LC MNE=50; Iron Age MNE=61; Byzantine MNE=41).

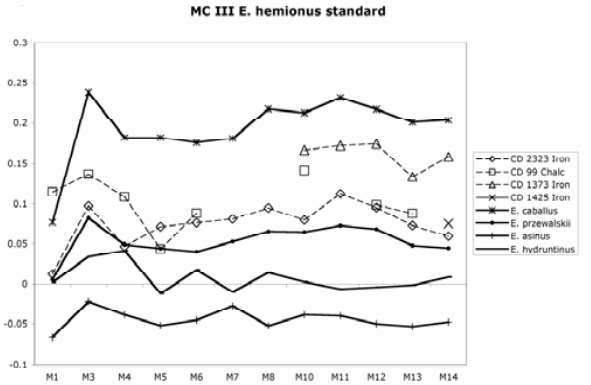

Figure 17. Simpson diagram representing the morphological relationship between equid third metacarpals from Çadır and those from selected equids. *E. hemionus onager* is used as the standard (0.0 on the Y-axis). Measurements and standards after Eisenmann and Beckouche (1986).
All Çadır specimens are intermediate between small wild horses and large domestic workhorses.

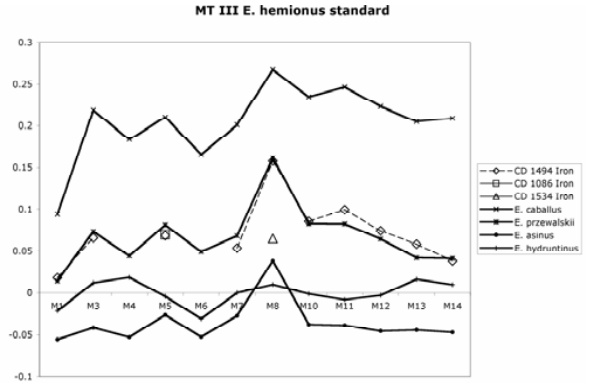

Figure 18. Simpson diagram representing the morphological relationship between equid third metatarsals from Çadır and those from selected equids. *E. hemionus onager* is used as the standard (0.0 on the Y-axis). Measurements and standards after Eisenmann and Beckouche (1986). Two Çadır specimens are similar in proportions to small wild horses, while one specimen (CD1534) is more similar to a donkey.

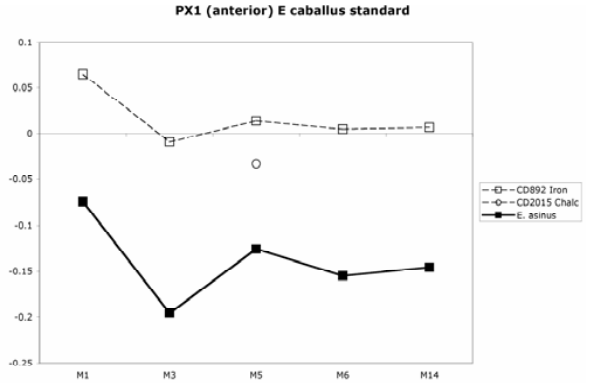

Figure 19. Simpson diagram representing the morphological relationship between anterior equid first phalanges from Çadır and those from selected equids. *E. caballus* is used as the standard (0.0 on the Y-axis). Measurements and standards after Dive and Eisenmann (1991).

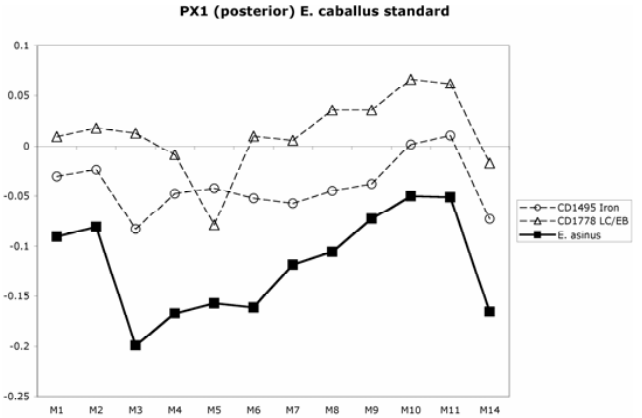

Figure 20. Simpson diagram representing the morphological relationship between posterior equid first phalanges from Çadır and those from selected equids. *E. caballus* is used as the standard (0.0 on the Y-axis). Measurements and standards after Dive and Eisenmann (1991).

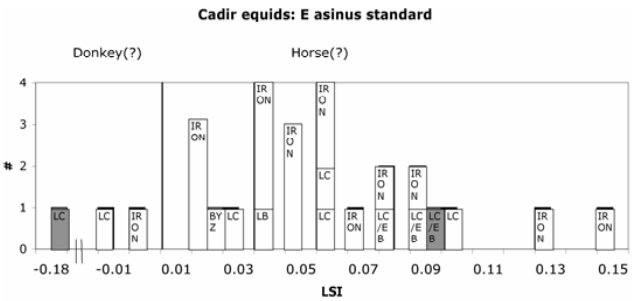

Figure 21. Log Size Index (LSI) values for fused (black) and unfused (gray) equid specimens from LC, LC/EB, LB, Iron Age, and Byzantine levels at Çadır. Standard animal is a modern donkey.

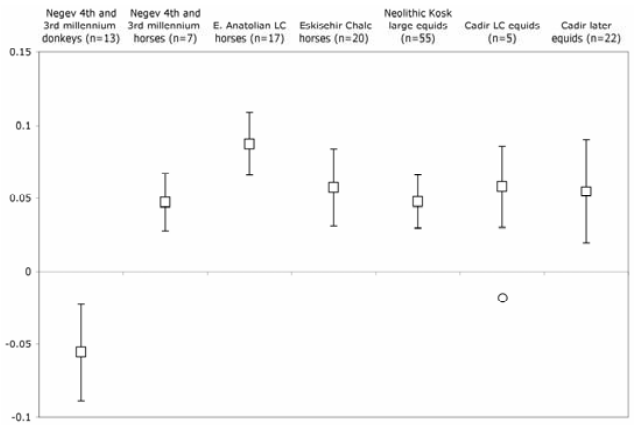

Figure 22. Mean and one standard deviation ranges for LSI values from selected samples of wild and early domestic equids from the Near East compared to equids from LC and later levels at Çadır. Donkey and horse specimens from the Negev are thought to be domestic (Grigson 1993). East Anatolian LC horses (Boessneck and von den Driesch 1976), Eskişehir Chalcolithic horses (from Orman Fidanlığı and Kes Kaya [6th and 5th millennium BC]) (Uerpmann 2001), and Neolithic Köşk horses (late 7th early 6th millennium BC) are thought to be wild (although Bökönyi 1991 argues that East Anatolian horses are domesticates).